Compact disc recorder

CDR538/CDR560

CDR538/00S
CDR560/00S/11S/13S

Service
Service
Service

Service Manual

SERVICING

For servicing, the set can be divided into two parts.

1. The Display board, the Connector interface board and the Level / Headphone board have to be repaired on component level. The power supply is available as a spare part but can also be repaired on component level.
2. The loader (containing CD mechanism and CDM-board) and the Main board will be exchanged completely in case of failure. Both are available as sparepart. For easy diagnostics, the set has been equipped with a selfdiagnose program. Defective loaders and main boards have to be returned for central repair.

Also available: Circuit description:"The basics of Compact Disc Recordable / Rewritable.
Service codenumber 4822 725 25242.

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COMPACT disc DIGITAL AUDIO Recordable ReWritable

COMPACT disc DIGITAL AUDIO Recordable

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PHILIPS

TECHNICAL SPECIFICATIONS

General

1. Mains voltage
   /00/06/11/13 84-250V
   /17 117V
2. Mains frequency 50-60Hz
3. Power consumption 15W

Input/Output

1. **Line output.**
   Output level: 2Vrms at 0dB.
   Output resistance: 200Ω.
2. **Line input.**
   input sensitivity: 500mVrms.
   Input impedance: 50kΩ.
   Maximum input voltage: 5Vrms.
3. **Digital output.**
   Format: AES/EBU format according IEC958 (consumer format).
   Sampling frequency: 44.1kHz.
   output resistance: 75Ω.
4. **Digital input.**
   Format: AES/EBU format according IEC958 (consumer format).
   Sampling frequency: 44.1kHz.
   Input resistance: 75Ω.
5. **Optical input.**
   Format: AES/EBU format according IEC958 (consumer format).
   Sampling frequency: 44.1kHz.

Audio performance

Cinch analog output (playback path).

Output voltage: 2Vrms ± 2dB. (0dB digital).
Frequency range F.R.: 20Hz < F.R. < 20kHz.
Amplitude linearity: ± 0.3dB.
typical.: ± 0.1dB.
Channel unbalance: <0.3dB at 1kHz.
typical: ±0.2dB.
Output resistance: 200Ω.
Phase non-linearity: <0.2° at 1kHz.
Outband attenuation: 50dB above 30kHz.
Channel separation: >90dB at 1kHz.
typical: 110dB.
>85dB from 20Hz. until 20kHz.
typical: >93dB.
S/N-ratio A-weighted: >98dB.
typical: 105dB.
S/N-ratio unweighted: >95dB.
typical: 100dB.
Dynamic range: >92dB. at 1kHz.
typical: 96dB.
>90dB from 20Hz. until 20kHz.
typical: 96dB.
THD+N: >82dB from 20Hz. until 20kHz.
typical: 85dB.

Cinch analog input/output (monitor path).

Measured with Audio precision system one.
Input voltage is 500mVrms.

Output voltage: 2Vrms ± 2dB. (0dB digital).
Frequency range F.R.: 20Hz < F.R. < 20kHz.
Amplitude linearity: ± 0.3dB.
typical.: ± 0.1dB.
Channel unbalance: <0.3dB at 1kHz.
typical: ±0.2dB.
Output resistance: 200Ω.
Phase non-linearity: <0.2° at 1kHz.
Outband attenuation: 50dB above 30kHz.
Channel separation: >90dB at 1kHz.
typical: 98dB.
>85dB from 20Hz. until 20kHz.
typical: >92dB.
S/N-ratio unweighted: >84dB.
typical: 88dB.
Dynamic range: >85dB. at 1kHz.
typical: 90dB.
THD+N: >80dB from 20Hz. until 20kHz.
typical: 85dB.
Intermodulation THD: >80dB.

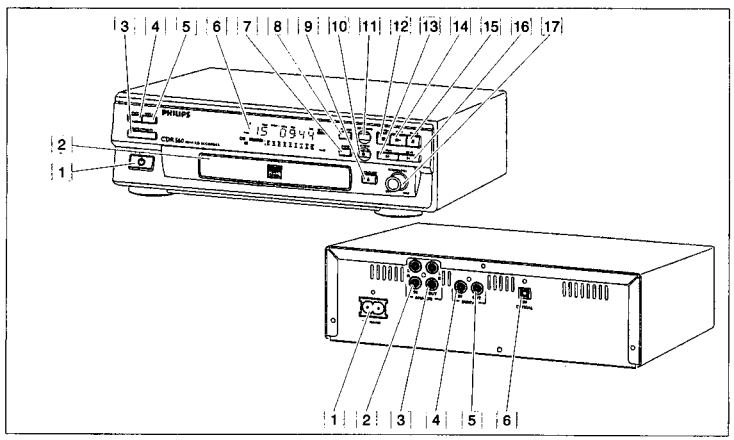
Dimensions and weight

1. Apparatus tray closed: WxDxH 265 x 305 x 75
2. Weight without packaging: 2,6 kg
3. Weight in packaging: 3,6 kg

Laser Device Unit

1. Material: GaAlAs
2. Wave length: 775→795 nm(at 25°C)
3. Laser output
   read: 0,7→0,9 mW
   write: 13→18 mW
4. Class: 3B

CONTROLS AND CONNECTIONS



Controls on the front

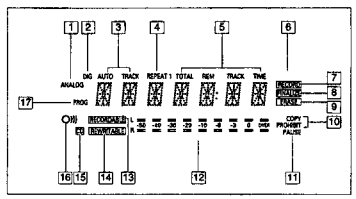
1 **ON/OFF** ..... turns the CD recorder ON and OFF
2 Disc tray
3 **AUTO/MANUAL** .. selects track increase method
4 **SOURCE**..... selects digital or analog input
5 **DISPLAY** ..... selects display information
6 DISPLAY (information screen)
7 **ERASE**..... erases recording
8 **FINALIZE**..... finalizes recording
9 **OPEN/CLOSE**..... opens/closes disc tray
10 **RECORD**..... records
11 **CD-SYNC** ..... synchronized recording (automatic start when recording)
12 **STOP** ■ ..... stops
13 ⏮..... previous track/searches back
14 **PLAY** ▶..... starts play or record
15 **PAUSE** II ..... interrupts play
16 ⏭..... next track/searches forward
17 **REC LEVEL** ..... adjusts the recording level (analog)

Connections at the back

1 Connection to mains
2 **ANALOG IN**..... connects to the line output of an amplifier. (left and right)
3 **ANALOG OUT**.... connects to the line input of an amplifier. (left and right)
4 **DIGITAL IN** ..... connects to the digital coaxial output of a CD player
5 **DIGITAL OUT**..... connects to the digital coaxial input of e.g. amplifier or recording device
6 **OPTICAL IN**..... connects to the digital optical output of a CD player

DISPLAY

DISPLAY explanation



1 **ANALOG**..... analog input is selected
2 **DIG** ..... lights when digital input is selected and flashes when digital input is incorrect.
3 **AUTO TRACK**..... automatically increasing track numbers
4 **REPEAT (1)**..... repeat function activated during play
5 Track number and time.
6 **CD-SYNC** ..... synchronized recording is active.
7 **RECORD** ..... lights during recording and flashes in record standby
8 **FINALIZE**..... lights during finalizing and flashes in finalize standby
9 **ERASE**..... lights during erase recording and flashes in erase standby
10 **COPY PROHIBIT**... Lights when trying to record digital protected audio.
11 **PAUSE** ..... pause function is active
12 Record/play level bar (analog)
13 **RECORDABLE** .... Unfinalized CD-R disc inserted
14 **REWRITABLE**..... CD-RW disc inserted
15 **CD** ..... CD inserted (a pre-recorded CD or finalized CD-R or CD-RW disc)
16))) ..... remote control active
17 **PROG**..... programmed play

DISPLAY messages

Messages, as listed and explained here, may appear on the display for your guidance.

READING ....reading disc information
OPC .....during OPC procedure
OPEN .....during tray opening
CLOSE .....during tray closing
NO DISC ....no disc inserted, or disc unreadable
UPDATE .....updating disc contents
ERROR .....write error during recording
RECOVER ..during recovery procedure
WAIT .....recording stop (4 seconds) in progress
SYNC .....during synchronized recording standby
TRACK .....during erase-track standby
DISC .....during erase-disc standby
SERVICE ..selftest failed
OPCFAIL ....laser power calibration failed. Further recording not possible
FULL .....program full
CD FULL ....no more recording possible
EMPTY .....no recordings on disc, finalizing not possible
NO AUDIO (flashing) no audio disc loaded or failure to read data
FINAL .....laser power calibration performed 96 times, finalize disc
COAXIAL ..digital coaxial input selected
OPTICAL ..digital optical input selected
SHUFFLE ..during shuffle
RC-DISC ..recovered disc. Finalizing not possible
TOC .....flashes during unfinalize disc standby, lights during unfinalize disc
INPUT .....during input selection (CD-SYNC)
ANALOG .....analog input selected

Connections general

For recording the CD recorder has the following inputs:
- Digital optical input
- Digital coaxial input
- Analog input

For play back the CD recorder has the following outputs:
- Digital coaxial output
- Analog output

The connections you make will depend upon the possibilities your audio equipment offers. Please refer to the user manuals for your other audio equipment first.

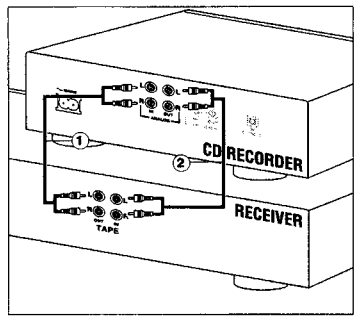
Recordings made from a digital source (CD player) via the digital optical or digital coaxial connection will give the best performance in audio and usability (e.g. auto-track). (The digital optical connection is less sensitive to external disturbances).
If your equipment does not offer digital connections, the high quality Analog-Digital-Convertor of your CD recorder will ensure very good audio performance when recordings are made from the analog input.

Playback via the digital coaxial output of the CD recorder gives the best audio performance.
If your equipment does not offer digital connections the high quality Digital-Analog-Convertor of the CD recorder ensures a very good sound quality via the analog output.

We advise you always to establish both digital and analog connections. In this way you can always make analog recordings when digital recording is not possible.

Below we describe the most common ways of connecting the CD recorder. If you still have difficulties with the connections you always can contact Philips Consumer Service desk in your country.

Analog connections



Use the audio cables supplied. Connect the red plugs to the R sockets, and the white plugs to the L sockets.

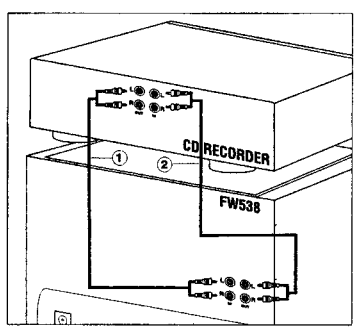
1 For recording, connect cable ① between the ANALOG IN-sockets on the CD recorder and the LINE- or TAPE OUT-sockets of an amplifier (FW538).

Note: For recording directly from a CD player the analog input of the CD recorder should be connected to the analog output of the CD player.

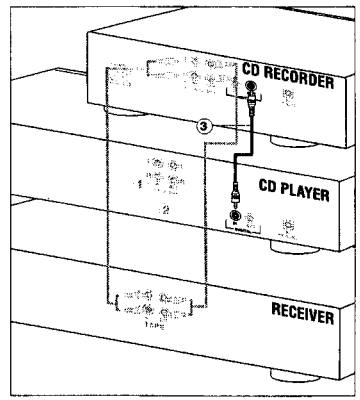
2 For playback, connect cable ② between the ANALOG OUT-sockets on the CD recorder and the input sockets of an amplifier e.g. TAPE IN, CD-R or AUX (FW538).

Note: Never use the PHONO input.

For use with FW538:



Digital coaxial connections

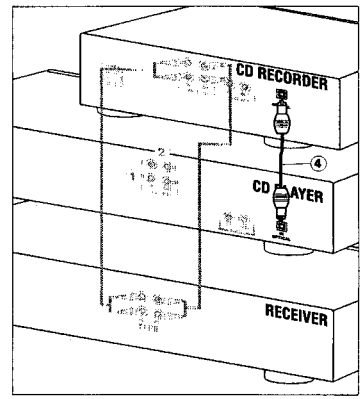


Use the supplied cable with the black plugs.

1 For recording, connect the cable ③ between the DIGITAL IN-socket on the CD recorder and the DIGITAL OUT-socket of a CD player.

Note: Your CD recorder is equipped with a digital coaxial output. This output can be used for digital playback.

Digital optical connections

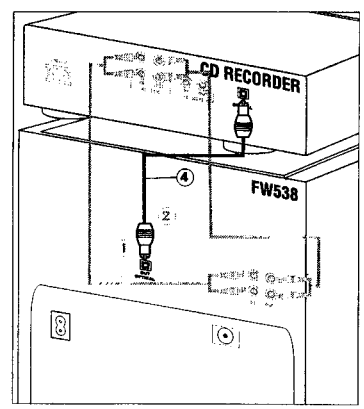


1 Remove the dust caps from the digital optical connections. (We recommend you to save the caps).

2 For recording, connect a fibre-optic cable ④ between the digital optical input of the CD recorder and the digital-optical output of a CD player.(FW538)

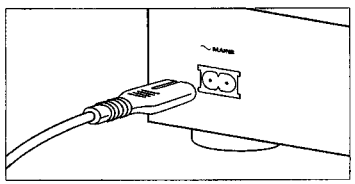
Note: For playback the digital coaxial output or analog output should be connected to an amplifier.

For use with FW538:



INSTALLATION

Power supply



1 Plug the power cord supplied into the MAINS connector on the CD recorder, then into a mains socket.

2 Press ON/OFF to turn the CD recorder on.

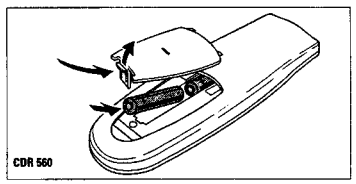
Note:

- *The CD recorder will automatically adjust to the local mains voltage.*
- *When the CD recorder is in the "OFF" position, it is still consuming some power. If you wish to disconnect your CD recorder completely from the mains, withdraw the plug from the AC Outlet.*

Setup recommendations

- Place the CD recorder on a solid, vibration free surface.
- Do not place the CD recorder near a source of heat or in direct sunlight.
- Do not use the CD recorder under extremely damp conditions.
- If the CD recorder is placed in a cabinet, make sure that a 2,5 cm space remains free on all sides of the recorder for proper ventilation.

Inserting batteries in the remote control



Note: For CDR538 see Remote Control FW538.

1 Open the battery compartment cover.

2 Insert 2 batteries (AAA, R03 or UM-4; as supplied) as shown.

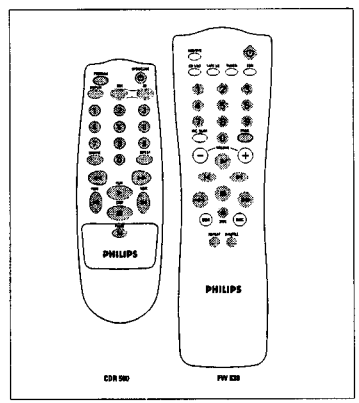
3 Replace the cover.

Note: We recommend using 2 batteries of the same type and condition.

Batteries contain chemical substances, so they should be disposed of properly.

REMOTE CONTROL & INSERTING DISCS

Remote control commands

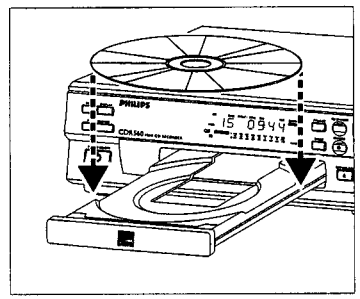


PROGRAM ..... programs track numbers
DISPLAY ..... selects display information
Number keys 0 - 9 ... Selets a track by number
SHUFFLE ..... plays CD(RW) or program in random order
◄◄ ..... Searches backward
PREVIOUS ⏮ ..... selects the beginning of a previous track
STOP ■ ..... stops CD(RW) and clears a program
PAUSE II ..... interrupts CD(RW) play
NEXT ⏭ ..... selects the beginning of subsequent track
PLAY ► ..... starts CD(RW) play
►► ..... Searches forward
REPEAT ..... repeat play
CD ..... CDR 765 only
CD-R ..... CDR 765 only
OPEN/CLOSE ..... Opens or closes the disc tray

While you press a button on the remote control, the indicator on the display lights up.

Note: Unless otherwise stated, all controls are on the front of the CD recorder. When provided on the remote control, you can also use the corresponding buttons.

Inserting discs



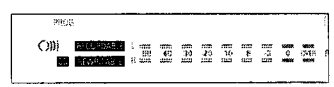
1 Press OPEN/CLOSE ***(6)*** to open the disc tray.

2 Insert a CD, CD-R or, CD-RW in the appropriate recess in the tray, label side up.

IMPORTANT:
For recording it is important that the blank disc is completely free from dust particles or scratches. (see Disc Maintenance, p.5).

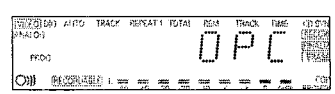
3 Gently push the front of the tray or press OPEN/CLOSE to close the tray (see also Playing a CD).

⇒ The display will show the type of disc you inserted.



- If a CD-R is finalized it will show **CD** on the display.
- If a CD-RW is finalized it remains a CD-ReWritable and will show **CD REWRITABLE** on your display.

If you insert a blank or partly-recorded CD-R or CD-RW, the CD recorder will calibrate the disc for optimum recording. During this process the display will first show OPC and then the number of audio tracks. Calibration can take up to 25 seconds.



Note: Only Audio CDs will be accepted. If a non-audio disc is inserted, the display shows NO AUDIO.

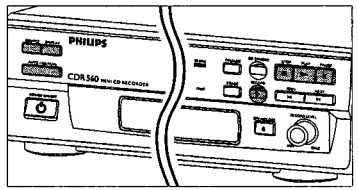
Remarks about recording

You will soon discover how easy it is to make your own CDs. Nevertheless, it is advisable to use a CD-RW disc for your first try. We will describe the 3 ways to make recordings:
- Digital unsynchronized
- Digital synchronized
- Analog

- The recording procedure is the same for CD-Rs or CD-RWs.
- If the disc is a CD-RW and is already finalized you must unfinalize it first *(p.15)*.
- If the disc already contains recordings, the CD recorder will automatically search for the end of the last track, so that recording can start from there.
- There must be at least 7 seconds of recording time left on the disc, otherwise you will not be able to enter record standby mode.
- If the display indicates **COPY PROHIBIT**, no digital recording can be made of the source material. Recording will not start or stops after 4 seconds.
- The **Serial Copy Management System** (SCMS) only allows digital recording under specific conditions:
  - This means that it is not possible to make a digital copy from a digital copy.
  - Analog recording is always possible !
  - The number of recordings from the original is unlimited.
- A maximum of 99 tracks can be recorded on a disc. Minimum allowable track length is 4 seconds.
- Digital recordings can be made from CDs (or other sources with an output Sample Frequency of 44.1 kHz +/- 100 ppm) via the digital input.

Important:
If you want to play the recorded CD-R disc on a regular CD player, it must first be finalized. See finalizing discs (p.15).
Finalized CD-RW discs play only on CD-RW compatible CD players.

Digital recording - unsynchronized



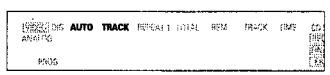
Preparing for digital recording

1 Make sure the disc is absolutely free of scratches and dust particles.

2 Press SOURCE repeatedly until (depending on the digital connection used):

⇒ **DIG** COAXIAL or **DIG** OPTICAL appears on the display.

3 Press AUTO/MANUAL to switch between auto and manual track numbering.
⇒ If AUTO is selected (preferred), **AUTO TRACK** appears on the display.



- AUTO: The track increments are automatically taken over from the digital source material.
- MANUAL: Track numbers can be incremented manually by pressing ⏭. (minimum track length is 4 sec).
  (This can also be done in AUTO mode).
- Track numbers cannot be changed after recording.

Note: Auto track works only with Consumer Sources with a digital output signal according to the IEC 958 (consumer part) audio standard.

Start digital recording

1 With the recorder stopped, press RECORD to enter the Record standby mode.
⇒ **RECORD** flashes.

- If **DIG** also flashes, the digital connection is incorrect.

2 To start recording, press PLAY and immediately start the source (from stop-mode).
⇒ **RECORD** lights continuously.The track number and recording time used appear on the display.

- To record a 3-second silence at the start of a track, press PAUSE.
- To check the (remaining) recording time, press DISPLAY. (This can also be done during the recording)

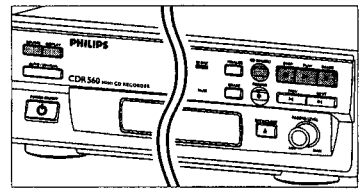
3 To stop recording, press STOP on the CD recorder.
⇒ **RECORD** goes out.

- To interrupt recording, press PAUSE.
⇒ **RECORD** starts to flash. Resume at step 2.

After recording the display will show UPDATE for several seconds.

*Note: With **AUTO TRACK** on, the recorder will stop automatically. Recordings from DAT or DCC will stop after 20 seconds silence. With **AUTO TRACK** off, the **AUTO STOP** mode is disabled.*

Synchronized digital recording - CD-SYNC



Preparing for synchronized digital recording

The CD-SYNC feature enables you to make fast and easy digital recording of a CD. Track increments are automatically detected from the digital source material. Track increments cannot be added manually.

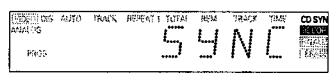
1 Make sure the disc is absolutely free of scratches and dust particles.

2 Press SOURCE repeatedly until (depending on the connection used):

⇒ **DIG** COAXIAL or **DIG** OPTICAL appears on the display.

Start synchronized digital recording

1 With the CD recorder stopped, press CD-SYNC.
⇒ On the display, **CD-SYNC** & SYNC appears. After a time, **RECORD** starts to flash.



- If **DIG** also flashes, the digital connection is incorrect.

2 To start recording, press PLAY on the digital source.
⇒ The CD recorder automatically starts to record and **RECORD** lights continuously. The track number and recording time used appear on the display

- If, however, you start the source during a track, CD-SYNC recording starts at the beginning of the next track.
- To check the (remaining) recording time, press DISPLAY. (This can also be done during recording)

3 To stop recording, press STOP on the CD recorder.
⇒ **CD-SYNC** and **RECORD** go out.

- To interrupt recording, press PAUSE.
⇒ **RECORD** starts to flash. To resume, press PLAY on the CD recorder.

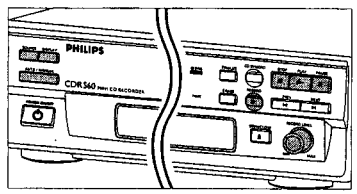
After recording the display will show UPDATE for several seconds.

English

Note:
- *The CD recorder will not start until it recognizes a digital signal. Although the reaction time is less than 200 milliseconds, the very beginning of the music may sometimes not be recorded. If this happens, you can start the recording manually (see digital recording - unsynchronized).*

- *Recordings from DAT or DCC will only stop after 20 seconds silence.*

Analog recording

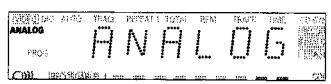


Only make analog recordings if digital recording is not possible.

Preparing for analog recording

1 Make sure the disc is absolutely free of scratches and dust particles.

2 Press SOURCE repeatedly until:
⇒ **ANALOG** appears on the display.



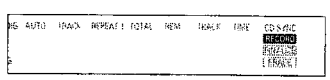
3 Press AUTO/MANUAL to switch between auto and manual track numbering.
⇒ If Auto is selected (preferred), **AUTO TRACK** appears on the display.

- AUTO: The track number is automatically incremented after a silence on the original of minimum 3 seconds.

- MANUAL: Track numbers can be incremented manually by pressing ⏭. (minimum track length is 4 sec). (This can also be done in AUTO mode)

- Track numbers cannot be changed after recording.

4 With the recorder stopped, press RECORD to enter Record standby mode.
⇒ **RECORD** flashes



5 Play the source first to set the optimal recording level on the CD recorder.

6 Turn the REC LEVEL control so that, on the Record/Play Level bar, all the blue segments are alight, but the red segments do not light continuously during the loudest passages.

7 Stop the source.

English

Start analog recording

1 To start recording, press PLAY on the CD recorder and immediately start the source.
⇒ **RECORD** lights continuously.The track number and recording time used appear on the display.

- To record a 3-second silence at the start of a track, press PAUSE.

- To check the (remaining) recording time, press DISPLAY. (This can also be done during the recording)

2 To stop recording, press STOP on the CD recorder.
⇒ **RECORD** goes out.

- To interrupt recording, press PAUSE.
⇒ **RECORD** starts to flash. Resume at step 1.

After recording the display will show *UPDATE* for several seconds.

*Note: With **AUTO TRACK** on, the recorder will stop automatically after 20 seconds silence. With **AUTO TRACK** off, the **AUTO STOP** mode is disabled.*

Finalizing CD-R & CD-RW discs

Finalizing is a simple procedure that is necessary in order to play the discs on a regular (non-recording) CD player.

Note: Finalizing prevents any further recording on a CD-R. A finalized CD-RW must be unfinalized to allow further recording or erasure of tracks.

1 Make sure the disc is absolutely free of scratches and dust particles.

2 With the recorder stopped press FINALIZE and then within 3 seconds press RECORD.

⇒ The approximate finalisation time appears in the display. Record & finalize lights up. The display counts down through the finalisation.
On completion, the total number of tracks and the total time recorded appears on the display.
For CD-R **CD RECORDABLE** becomes **CD** on display.
For CD-RW no change on display.

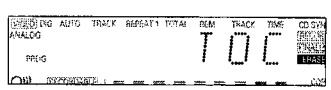
Finalizing will last at least 2 minutes.

Note: During finalisation, the CD recorder accepts no operating commands.

Unfinalizing CD-RW discs

For CD-RW discs only.
If you want to make more recordings (or erasures of tracks) on a finalized disc you must unfinalize it first. The Table of Contents (TOC) will be removed.

To unfinalize:
1 Press ERASE twice.
⇒ On the display, *TOC* and **ERASE** flash.



2 Press RECORD within 3 seconds.
⇒ *TOC* and **ERASE** light continuously during erasure.

Note: This will take approximately 1 minute.

Erasing CD-RW discs

For CD-RW discs only.

You can erase:
- track by track from the end.
- the entire disc.

To erase the last track :

1 Make sure the disc is not finalized (Showing OPC on display during start up). Otherwise unfinalize first (p.15)

2 Press ERASE.
⇒ On the display, TRACK and **ERASE** flash.

3 Press RECORD within 3 seconds.
⇒ TRACK and **ERASE** light continuously during erasure.

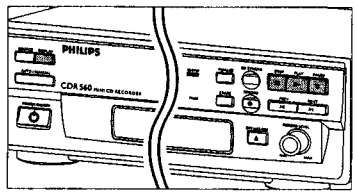
To erase the entire disc:

1 Press ERASE once (for finalized CD-RW) and twice (for unfinalized CD-RW)
⇒ On the display, DISC and **ERASE** flash.

2 Press RECORD within 3 seconds.
⇒ DISC and **ERASE** light continuously during erasure.

Erasure of a complete disc may take up to 1.5 minutes.

Playing a CD



1 Press PLAY to start CD play.
⇒ The track number and track time appear on the display, together with the record/play level indicator.

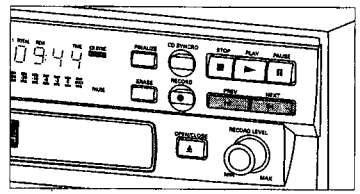
2 Press DISPLAY once, twice, or three times to see:
⇒ Remaining track time; Total remaining time; Track time with the record/play level bar off.

3 To interrupt play temporarily, press PAUSE.
⇒ **PAUSE** lights on the display

4 To continue play, press PAUSE again or press PLAY.

5 To stop play, press STOP.
⇒ The number of tracks and the total playing time appear on the display.

Selecting a track or searching



Selecting a track during play

1 Briefly press ⏮ or ⏭ one or more times.
⇒ Play skips to the beginning of the present, previous or subsequent tracks.

or

- Key in the required track number using the numerical keys on the remote control. For 2-digit track numbers, press the keys in rapid succession.
⇒ Play skips to the beginning of the selected track.

Selecting a track when CD play is stopped

1 Briefly press ⏮ or ⏭ one or more times.

2 Press PLAY.
⇒ Play starts at the selected track.

or

- Key in the required track number using the numerical keys on the remote control. For 2-digit track numbers, press the keys in rapid succession.

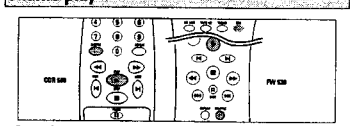
Searching during CD play

1 Hold down ⏮ or ⏭ (or ◀◀ or ▶▶ on the remote control).
⇒ The player first searches backwards or forwards at 10 times normal speed with sound at low volume, then goes to fast reverse or fast forward with sound muted.

2 Release the button at the desired passage.
⇒ Play starts at the desired passage.

Note: During Shuffle, Repeat or Programme play, search is restricted to within the track being played at the time.

Shuffle play



1 Press SHUFFLE (or PLAY) on the remote control before or during CD play to start shuffle play.
⇒ The tracks on the CD (or program if set) play in random order. SHUFFLE appears on the display between tracks.

2 Press SHUFFLE again to return to normal CD play.

Note: Shuffle is also cleared if you open the disc tray.

Repeat CD, track or program

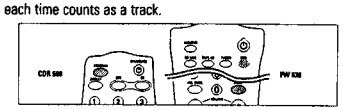
1 Press **REPEAT** on the remote control one or more times during CD play.
⇒ When **REPEAT 1** appears on the display, the current track plays repeatedly. When **REPEAT** appears on the display, the disc or programme plays repeatedly.

2 To return to normal play, press REPEAT one or more times until:
⇒ the repeat message disappears from the display.

Note:
- *You can use shuffle in combination with repeat CD or programme play.*
- *Repeat is also cleared if you open the disc tray.*

Programming

You can program up to 30 tracks to play in any desired sequence. Tracks can be programmed more than once, but each time counts as a track.



1 On the remote control press PROGRAM to start programming.
⇒ **PROG** flashes on the display.

2 Key in a track number with the number keys. For 2-digit numbers, press the keys in rapid succession.
⇒ On the display, the track number appears briefly, followed by the total programmed tracks and total programme time.

3 Repeat step 2 for all tracks to be programmed.

4 Press STOP or PROGRAM to end programming.
⇒ **PROG** lights continuously.

Note:
- *To review the program, press [⏮ or ⏭] in stop mode.*
- *To add more tracks to the programme, repeat steps 1 to 4.*
- *If you try to store more than 30 tracks, FULL appears on the display*

5 Press PLAY to start programmed play.

Clearing a program

1 Press STOP if necessary to stop programmed play.

2 Press STOP again to clear the program.
⇒ **PROG** disappears from the display.

Note: The program is also cleared if you open the disc tray.

FIXING PROBLEMS

Troubleshooting

If you think your CD recorder is defective, it is wise to check this list first and run the diagnostic program. Maybe you have forgotten a simple step.

Warning!
Under no circumstances should you attempt to repair the CD recorder yourself as this will invalidate the guarantee.

SYMPTOM: • SOLUTION:

No power
- ensure that the ON/OFF button is on
- ensure that the mains cable is plugged in correctly
- switch the recorder OFF and then immediately back ON

Auto track does not work
- check if auto track is selected.
- check if there are 3 seconds silence in between the tracks (analog recording only)
- check if the source is a consumer source with the digital output according the IEC audio standard.

No sound
- check the audio connections
- if using an amplifier, try using a different source

Amplifier sound is distorted
- check that the CD recorder analog output is not connected to the amplifier Phono input.

Play will not start
- ensure that the label of the CD is facing up
- clean the disc
- check that the disc is not defective by trying another disc

Remote control does not work
- point the remote control directly at the CD recorder
- check the batteries and replace if necessary
- select right source first

Will not record
- clean the disc.
- check if CD-RW is not finalized.
- check that the disc is recordable and replace if necessary
- the disc is not an AUDIO disc
- wrong input source choosen.

Analog recording is distorted
- make sure the recording level is correct

20 second pause between recordings
- see synchronized digital recording (CD-SYNC) *(p. 13)*

Player does not react
- switch the ON/OFF button on the front of the player off and back on

SERVICE ***on display after switching on***
- try switching off and on again

RECOVER ***on display***
- a power failure has occured during recording, the CD recorder is attempting to repair the disc.
- if *RC-DISC* then appears on the display, the disc cannot be recorded further, and cannot be finalized. But can be played on a CD recorder.
- on a CD-RW disc, the track being recorded is lost, but further recording and finalization can still be done.
- if *OPC FAIL* appears, no further recording is possible.
  You can still use the disc as a CD on this recorder.

Diagnostic program

If the malfunction continues, perform the Diagnostic Program:

1 Switch the recorder off using ON/OFF.

2 Simultaneously press PLAY and STOP and switch the recorder back on using ON/OFF.
⇒ The display will now indicate *BUSY* and after a few minutes, the message will change to *ERROR* or *PASSED*

- If the *ERROR* message appears, your recorder is defective and needs to be repaired. Consult your supplier or call the Philips Consumer Line to find the nearest service centre. The number of the Consumer Line can be found in the guarantee booklet.

- If the *PASSED* message appears, you may be misinterpreting the user instructions or using an inappropriate disc, or there may be a mechanical defect or an incorrect connection. Carefully read the user instructions once again; and if necessary contact your supplier.

- If you cannot solve the problem, contact to the nearest service centre.

3 Switch off the recorder using ON/OFF to exit from the Diagnostic Program.

GENERAL INFORMATION

Discs for recording

For recording use, special audio discs must be used (for music only). These Discs bear the logos as shown below. The text 'DIGITAL AUDIO' is present ! Copyright fees have been paid on these discs in some countries.

Your recorder uses two types of discs for recording purposes:

- **CD-Audio Recordable** (CD-R) discs:
  Fully recorded and finalized, these discs play on all CD players and recorders.

- **CD-Audio ReWritable** (CD-RW) discs:
  Can be recorded, erased and re-recorded hunderds of times. When finalized, they play on CD-RW compatible CD players and recorders.
  In the course of 1999 most Philips CD players and recorders will be CD-RW compatible.

Discs for playback

Your CD recorder is able to play:

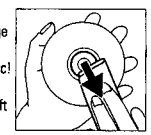
- All prerecorded audio CDs, and combined CDs such as CD Extra.
- All Audio CD-R and Audio CD-RW.

Note: CD-R discs recorded with a computer can only be used when they are correctly treated according the audio standard (IEC958: Consumer part).
Single session only!

Maintenance

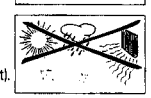
For recording it is very important to use dust and scratch free discs.

To clean a CD, wipe it in a straight line from the center toward the edge using a soft, lint-free cloth. A cleaning agent may damage the disc! Write only on the printed side of a CD-R or CD-RW, and only with a soft felt-tipped pen.



Clean the CD recorder with a soft, slightly dampened lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.

Do not expose the CD recorder, batteries or CDs to humidity, rain, sand or excessive heat (caused by heating equipment or direct sunlight).



If the CD recorder cannot read CDs correctly use a commonly available cleaning CD to clean the lens before taking the CD player to repair. Other cleaning methods may destroy the lens. Always keep the tray closed to avoid dust on the lens.

The lenses may cloud over when the CD recorder is suddenly moved from cold to warm surroundings. Playing a CD is not possible then. Leave the CD recorder in a warm environment until the moisture evaporates.

Accessories

- 2 Analog audio cables (with red and white plugs)
- 1 Digital coaxial cable (with black plugs)
- Power cord
- 2 Batteries
- Remote control
- Guarantee
- Optical cable (CDR538 only)

TECHNICIAN NOTES

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor elektrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise a leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller a ce que les composants ainsi que les outils que l'on utilise soient également a ce potentiel.

(D) WARNUNG

Alle IC und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).
Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern.
Sorgen sie dafür, das Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevita potrebbe essere fortemente ridatta in caso di non osservazione della piu grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt terug gebracht en dat onderdelen, identiek aan de gespecifieerde worden toegepast.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten.
Der Originalzustand des Gerats darf nicht verandert werden.
Fur Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago idetici a quelli specificati.

(F)
Les normes de sécurité exigent que l'appareil soit remis a l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

CAUTION INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
VARO! AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER SÄTTEILYLLE ÄLÄ KATSO SÄTEESEN.
VARNING OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN.
ADVERSEL USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UNSAETTELSE FOR STRÅLING.
DANGER INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
VORSICHT UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom,
Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before return to user/customer.
Ref.UL Standard NO.1492.

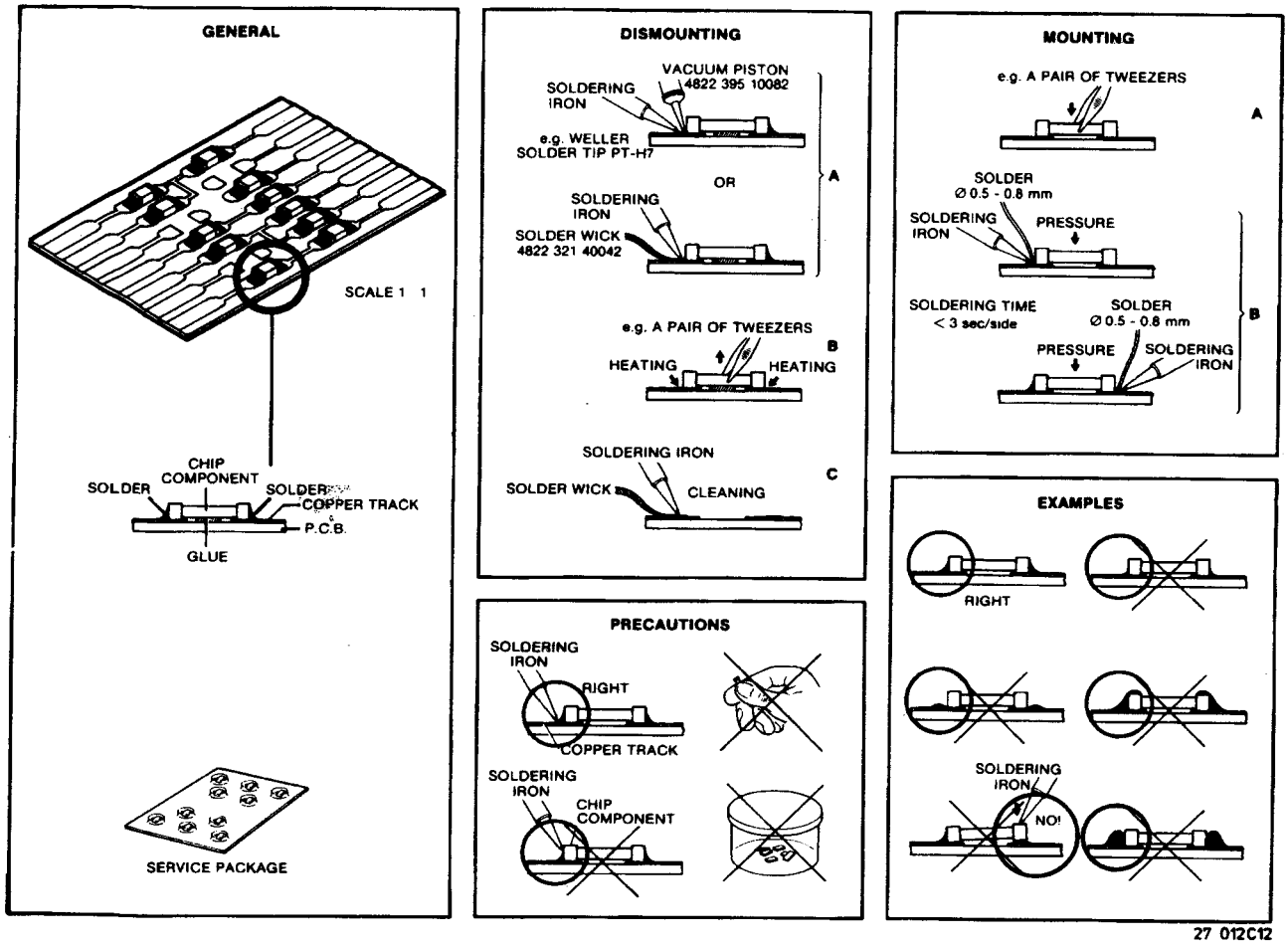
NOTE ON SAFETY:

Symbol ⚠ : Fire or electrical shock hazard. Only original parts should be used to replace any part with symbol ⚠
Any other component substitution(other than original type), may increase risk or fire or electrical shock hazard.

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne."

SERVICING HINTS

In the set chip components have been applied. For disassembly and assembly of chip components see the figure below.



SERVICE TOOLS

Audio signals disc	4822 397 30184
Disc without errors(SBC444) and disc with DO errors, black spots and fingerprints(SBC444A)	4822 397 30245
Disc(65 min , 1 kHz) without no pause	4822 397 30155
Maximum diameter disc(58.0 mm)	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132

4-3

SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Important

Proper service and repair is important to the safe, reliable operation of all Philips equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those units which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed according to the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with a ⚠ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematic diagrams and/or exploded views.

   Replacement parts without the same safety characteristics may create shock, fire, or other hazards.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.

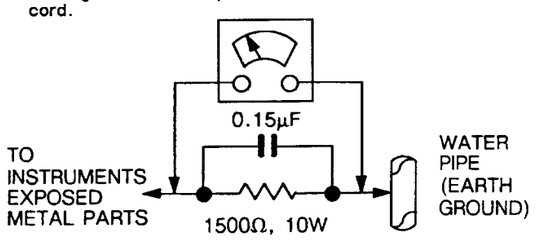
Fire and Shock Hazard (Continued)

9. After reassembly of the unit, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit is safe to operate without danger of electrical shock.

* Broken line: ▬ ▪ ▬ ▪ ▬ ▪ ▬ ▪ ▬

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled unit directly into the ac outlet.
2. Connect a 1.5k, 10W resistor paralleled by a 0.15uF. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Parts Replacement

1. Many electrical and mechanical parts in Philips equipment have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.
2. All ICs and many other semiconductor parts are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce the life of the part drastically.

LASER NOTE:

DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
CAUTION - The use of optical instruments with this product will increase eye hazard.

DISMANTLING INSTRUCTIONS

See exploded view for item numbers

Cover 151
⇒ Remove 7 screws
166→169 at sides
170→172 at rearside
⇒ Lift cover at rearside to remove

mounting
↑
↓
demounting

CDR module containing:
Loader 81
Main board 1001
Loader bracket 82
⇒ remove tray front 65
⇒ remove connections
⇒ remove 4 screws 90→93 (loader bracket 82 → frame 181)
⇒ remove screw 210 (screening bracket 270 → backplate 266)
⇒ remove screw 94 (screening bracket 270 → frame 181)
⇒ demount screening bracket 270
⇒ demount CDR module

Main board 1001
⇒ remove 4 screws 97→100 (main board → loader)
⇒ remove connection to tray motor and tray switch
⇒ unlock 3 flex connectors to CDM board
⇒ remove carefully flex connections
⇒ demount main board

Loader 81
⇒ remove 4 screws 85→88 (loader → loader bracket 82)
⇒ demount loader

Front assy 1
⇒ remove 2 screws 41, 42 (ground wires to frame)
⇒ remove 2 screws 182, 183 (front→frame)
⇒ unlock front from frame by releasing 4 snaps(1 on the left, 2 in the middle and 1 on the right
⇒ put assy after demounting in front of the set (service position)

Display board 1002
⇒ remove 7 screws 26→32 (board→front)
⇒ demount board

Level board 1002
⇒ remove level knob 35 by pulling it forward
⇒ remove screws 37,38
⇒ demount board

On/Off board 1002
⇒ Remove power button assy 9
⇒ remove screw 106 (board→front)
⇒ demount board

Connector I/O board 1001
⇒ remove flex connection to main board
⇒ remove screws 200→202 (cinches→backplate 266)
⇒ demount board

Power supply board 1003
⇒ remove screw 210 (screening bracket 270 → backplate 266)
⇒ remove screw 94 (screening bracket 270 → frame 181)
⇒ demount screening bracket 270
⇒ remove connections
⇒ remove 3 screws 190,191,192 (board→frame 181)
⇒ remove screw 205 (mains inlet→backplate 266)
⇒ unlock snap of spacer 195.
⇒ demount board

WARNING: POSSIBILITY OF HIGH VOLTAGE (300V) ON HEAT SINK, EVEN AFTER DEMOUNTING OF PCB. DISCHARGE ELCAP 2121.

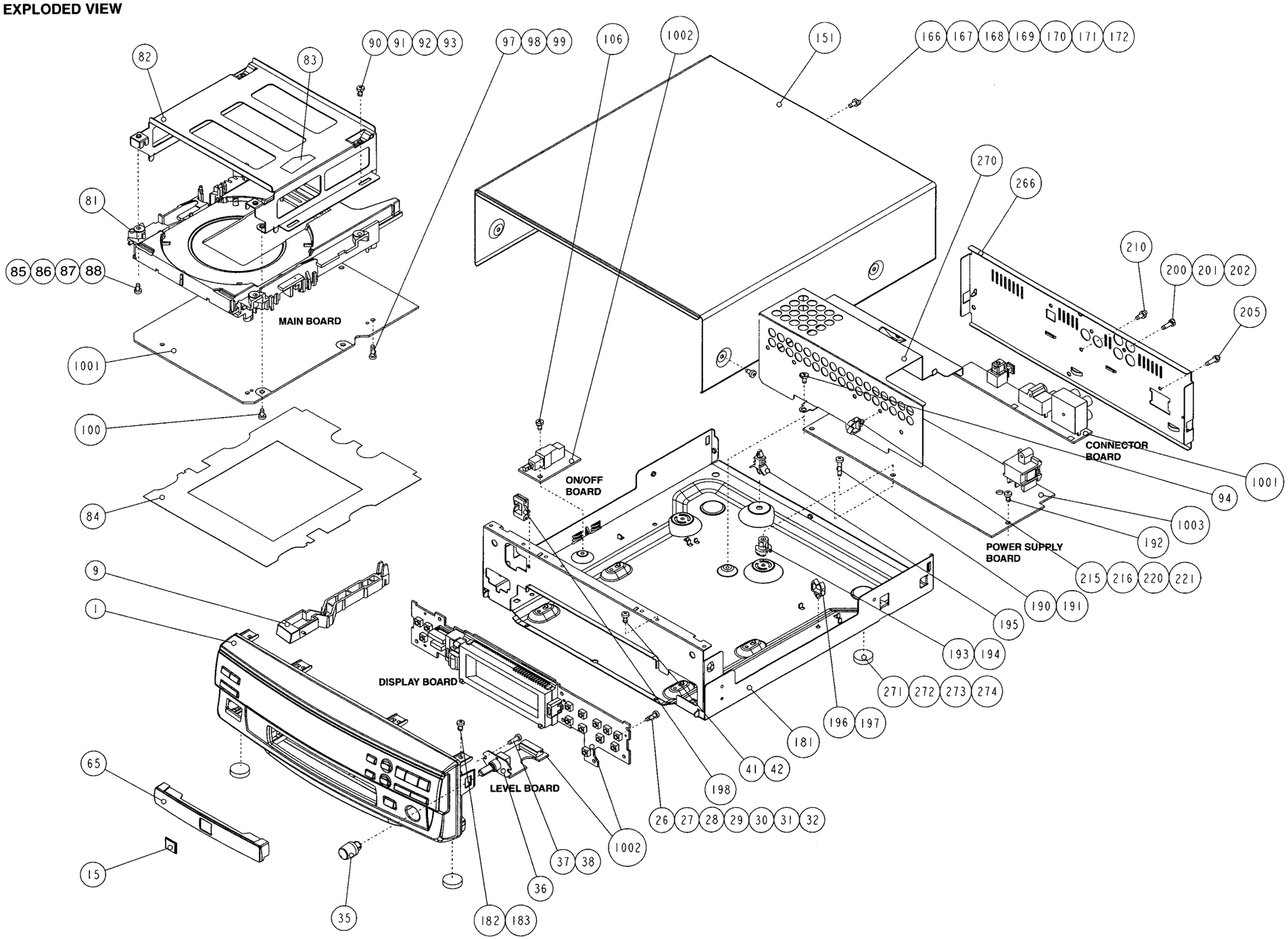
5-1

MECHANICAL PARTSLIST

1	4822 459 05124	FRONT ASSY CDR538
1	4822 459 05126	FRONT ASSY CDR560
9	4822 410 12066	POWER BUTTON ASSY
15	4822 454 13339	CDRW - LOGO
35	4822 410 12067	REC. LEVEL KNOB ASSY
65	4822 459 05125	TRAY FRONT ASSY
81	4822 691 10737	CDR LOADER CDL3610/01
271-274	4822 462 40683	FOOT
301⚠	4822 321 10249	SBC1201 MAINS CABLE
312-313	4822 321 11357	AUDIO CORD SET
316	4822 324 00007	OPTICAL CORD SET
317	4822 321 61452	DIG OUT CABLE
318	4822 219 10559	REMOTE CONTROL RC07110/01
1001	4822 214 12845	MAIN BOARD CDR538/560
1003⚠	4822 218 11938	POWER SUPPLY 20PS314/00

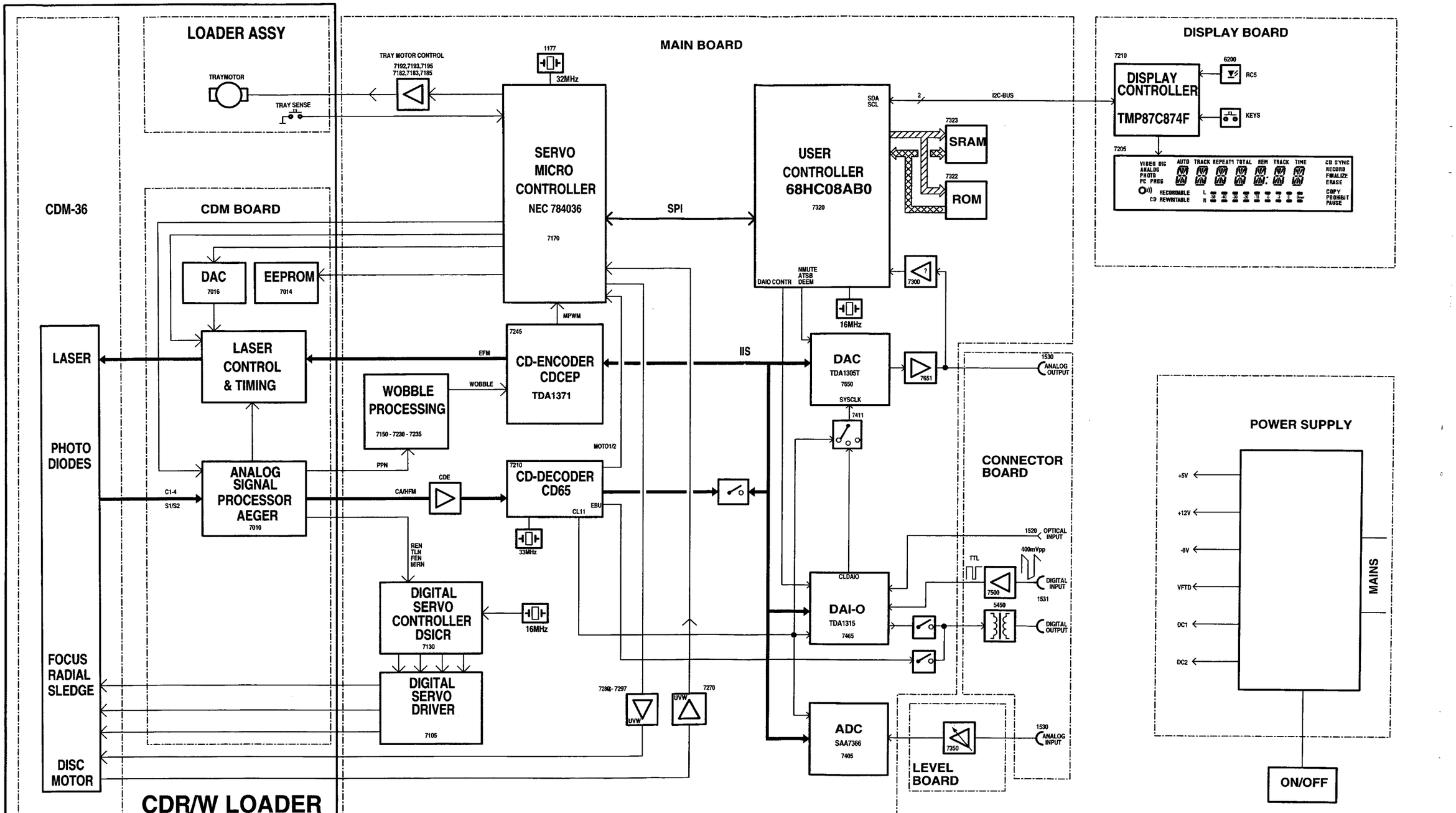
5-2

EXPLODED VIEW



6-1

OVERALL BLOCKDIAGRAM



SIGNALS AND ABBREVIATIONS

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
+12Va	Supply voltage	Single power supply +12V for op-amps 7150, 7235
+12Vb	Supply voltage	Power supply +12V for op-amps
+4V	Supply from CDR loader	Power supply +4V for servo microcontroller
+5Va	Supply voltage	Analog power supply +5V
+5Vb	Supply voltage	Digital power supply +5V
+5VDS	Supply voltage	Power supply +5V for Connector Part
+5VM	Supply voltage	Power supply turntable motor control circuit
-8Va	Supply voltage	Power supply -8V
A1A	IC7170→CONN.1101	Calculation β and HF0 Positive peak detector between CA and CALF
A2A	IC7170→CONN.1101	Beta = (A1-A2)/(A1+A2) Negative peak detector between CA and CALF
ACK	IC7320↔R3904(IC7170)	Acknowledge serial communication user microprocessor
AD[0:18]	IC7320→IC7322 IC7320→IC7323	External address bus of user processor
ADC		Analog/Digital Converter
ANACD	IC7320→IC7605	Control signal dubbing analog for protected tracks
ANAIN1	IC7320→IC7601	Control signal level setting analog input
ANAIN2	IC7320→IC7601	Control signal level setting analog input
ATSB	IC7320→IC7650	Attenuation 12 dB of DAC(active low) during search
BS	IC7320→IC7440	Block synchronisation
CA	CONN.1101→R3299	Central Aperture(C1+C2+C3+C4)DC →for Mod. calculation
CALF	IC7170→CONN.1101	CA low frequency
CD60		Decoder
CD60CLK	IC7210→IC7403	I2S clock from CD60
CD60WS	IC7210→IC7403	I2S word select from CD60
CDAICL	IC7320→IC7465	DAI-O interface clock
CDAIDA	IC7320↔IC7465	DAI-O interface data
CDAILD	IC7320→IC7465	DAI-O interface mode
CDCEP		CD-Circ Efm Encoder Plus
CDE	IC7170→R3255	CD erase
CDTRAYO	IC7320→CONN1380	CD loader tray open (CDR765) (not used)
CDTRAYC	IC7320→CONN1380	CD loader tray closed (CDR765) (not used)
CE_INT	IC7170←IC7245	CDCEP interrupt
CFLG	IC7210→CONN.1250	Correction flag output(CD60)
CL11	IC7210→IC7411	11.2896 MHz systemclock for ADC/DAC
CL16	IC7210→IC7241	164344 MHz systemclock (not used)
CLCE	IC7170→IC7245	µP clock output encoder(CD60)
CLDAIO	IC7465→IC7411	Clock output DAIO
CLDE	IC7170→IC7210	µP clock output decoder(CD60)
CLDS	IC7170→IC7130	µP clock output DSICR
CLKC0	IC7241→CONN1360	System clock for CD player (CDR765)
CLKCDCEP	IC7260→IC7245	I2S clock to CDCEP
CLKN2	CONN1360→IC7260	I2S clock from CD player (CDR765)
CLKQ	IC7245→IC7240 IC7245→IC7241	PLL clock output from encoder
CLKQD	IC7241→IC7240	CLKQ divided by 2
CLO3	IC7440→IC7411	GDIN clock3 out: system clock for DAC (option)
CLWP	IC7170→IC7245	µP clock Atip information CDCEP
COMCLK	IC7320↔R3165(IC7170)	Communication clock for data transfer from user microprocessor
COMSYNC	IC7320↔IC7170	Communication synchronisation from user microprocessor
CRIN	IC7440→IC7210	GDIN clock1 out: system clock for decoder CD60 (option)
CSRAM	IC7320→IC7323	Chip Select RAM

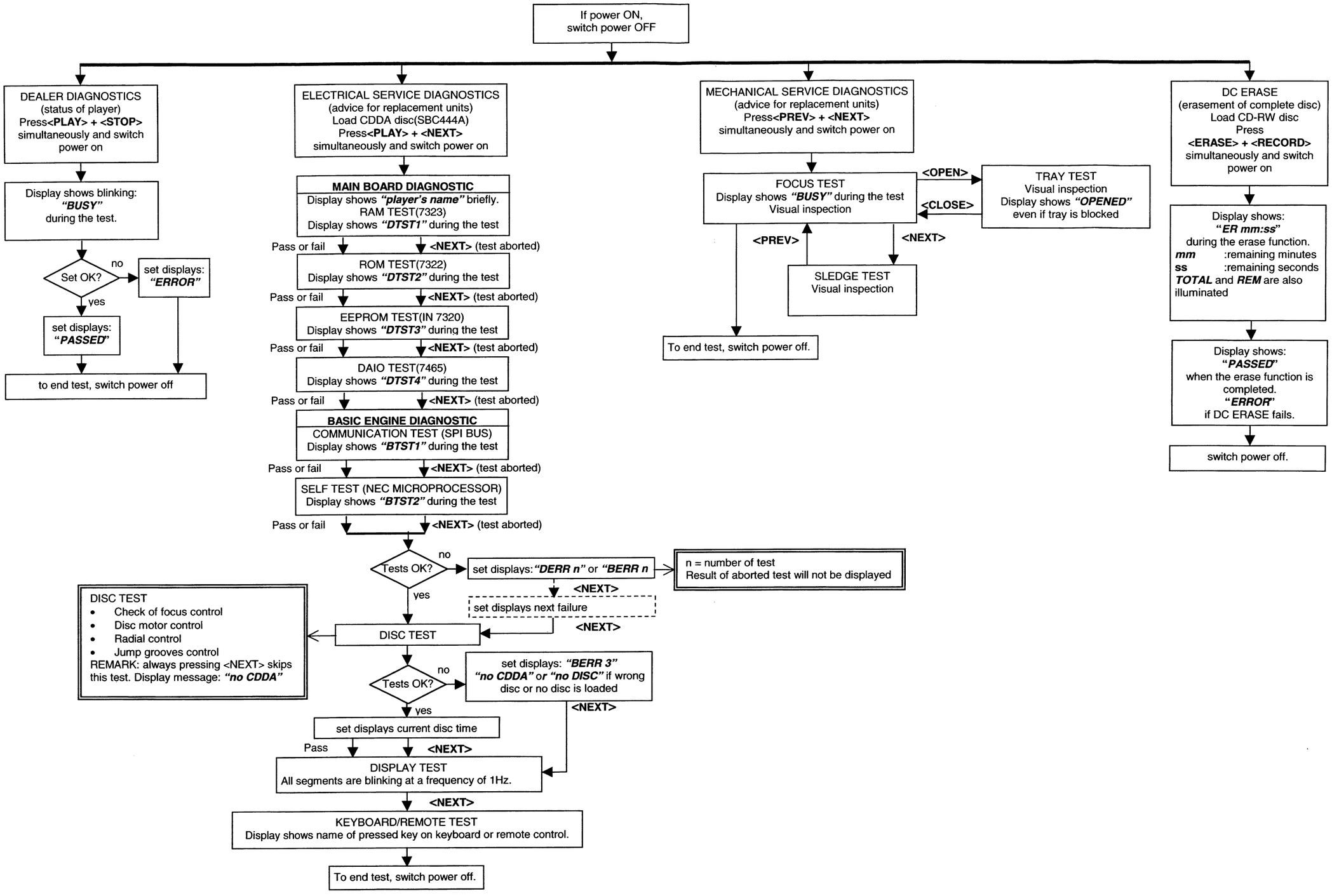
CSROM	IC7320→IC7322	Chip Select ROM
D[0:7]	IC7320↔IC7322 IC7320↔IC7323 IC7320↔IC7324	Data bus
DAC		Digital/Analog Converter
DACDCEP	IC7260↔IC7245	I2S data to CDCEP
DACE	IC7170→IC7245	µP data I/O CDCEP
DACL	IC7170→CONN.1102	DAC clock
DADE	IC7170→IC7210	uP data CDLIP
DADI	IC7170→CONN.1102	DAC data in (CDM)
DADS	IC7170→IC7130	µP data I/O DSICR
DAIN	IC7465↔IC7245	Data signal(CDCEP)
DAI-O		Digital Audio Input/Output
DAIO_REC	IC7325→IC7403	high during recording from digital in source, low to prevent conflict in IIS bus during playback and analog recording(option)
DALD	IC7170→CONN.1102	DAC load(CDM)
DAN2	CONN1360↔IC7260	I2S data from CD player (CDR765)
DAOUT	R3217(IC7210)→IC7403	I2S data output(CD60)
DATADIR	IC7320→IC7403	Data direction: control signal, HIGH during playback
DAWP	IC7170→IC7245	µP data Atip information(CDCEP)
DEEM1	IC7320→IC7650	Deemphasis active(44.1 kHz sample rate)
DIGIN	IC7410→IC7465 IC7410→IC7440	Digital input signal to DAIO and GDIN
DIGINEXT	CONN1400→IC7410	Digital input
DIGOUT	IC7465→CONN.1400	Digital output
DIGSW1	IC7320→IC7410	Control signal for digital input/output selection
DIGSW2	IC7320→IC7410	Control signal for digital input/output selection
DSA_ACK	IC7320→CONN1360	Data/strobe/acknowledge serial communication from USER uP to CD player (CDR765)
DSA_DATA	IC7320→CONN1360	Data/strobe/acknowledge serial communication from USER uP to CD player (CDR765)
DSA_STROBE	IC7320→CONN1360	Data/strobe/acknowledge serial communication from USER uP to CD player (CDR765)
DSICR		Digital Servo IC Recordable
EBUCD60	IC7210→IC7410	Digital out signal from CD60
EBUDAIO	IC7465→IC7410	Digital out signal from DAIO
EBUININT	CONN1360→IC7410	Digital input from CD player (CDR765)
EECL	IC7170→CONN.1102	EEPROM clock
EEDA	IC7170↔CONN.1102	EEPROM data
EFM	IC7245→IC7205	Eight to Fourtheen Modulation CDCEP output for monitoring (reduced voltage from CD60 to MONON)
EFMCLK	IC7245→CONN.1102	EFM clock 4.3218 or 8.6436 MHz
EFMM	IC7245→CONN.1102	EFM N-1
FEN	CONN.1101→IC7130	Focus Error Normalized = (C1 + C3 - C2 - C4)/(C1 + C2 + C3 + C4)
FEOFS	IC7170→R3133	Focus Error OFF Switch
FOC-	IC7105→CONN.1101	Focus actuator negative connection
FOC+	IC7105→CONN.1101	Focus actuator positive connection
FS	CONN.1102→R3152	FS = FS0 - DALFA(write power to laser control)
FSM	CONN.1102→D6155	Focused sense monitor
GDIN		General Digital Input (option)
GDINCL	IC7320→IC7440	GDIN interface clock
GDINDA	IC7320↔IC7440	GDIN interface data
GDINLD	IC7320→IC7440	GDIN interface mode
HALL_U, V, W	IC7170→IC7270 IC7170→IC7280	Hall element U, V, W of motor

HMSW	CONN.1101→IC7170	Home Switch
IISCLK	IC7603→IC7465 IC7603→IC7245 IC7403→IC7650	I2S-BUS clock
IISWS	R3219(IC7210)→IC7403	I2S-BUS word select
INTSLAVE	CONN1330→IC7320	Slave processor interrupt
KILL	T7446→R3671,3672	Kill signal to mute analog output signal
KILL_OUT	IC7320→R3473	Control signal to activate Kill signal
LDCE	IC7170←IC7245	µP load input(from CDCEP)
LDDE	IC7170→IC7210	µP load output decoder
LDDS	IC7170→IC7130	µP load output DSICR
LDON	IC7130→CONN.1102 IC7105→CONN.1102	Laser Diode ON(on read)
LEFTOUT	C2497→CONN.1400 C2497→CONN.1420 C2497→C2300	Analog left output
LWRT	IC7245→CONN.1102	Laser at writing power
MIRN	CONN.1101→IC7130	Mirror normalized
MISO	IC7320↔R3168(IC7170) IC7320↔CONN.1300	Master in, Slave out: data from Basic Engine to USER.
MONON	IC7170→IC7205	Monitoring EFM from CDCEP to CD60
MOSI	IC7320↔R3903(IC7170) IC7320↔CONN.1300	Master out, Slave in : data from USER to Basic Engine
MOTO1	IC7210→IC7170	Control signal for motor
MPWM	IC7170→IC7245	Motor Pulse Width Modulation
N=2	IC7320→IC7260	Control signal to close switch when dubbing (n = 2 !)
N2	IC7170→IC7240 IC7170→IC7205	N = high(double speed)
N4	IC7170→IC7205	N = high(fourfold speed)
NCLOSE	IC7170→R3196	Tray close (CDR loader)
NIRQ	IC7170→IC7245	Interrrupt request wobble processing(CDCEP)
NMUTE	IC7320→IC7650	Mute signal (active low)
NOPEN	IC7170→R3181	Tray open (CDR loader)
NRSMP	IC7245→CONN.1102	None read sample
OPTIN	CONN.1400→IC7440 CONN.1400→IC7465	Optical input
OTD	IC7130→IC7170	Off track dectection DISCR
OVLD	IC7603→IC7320	Overload flag input
PP	CONN.1101→C2231	XB or PPN(read or write)
PWM	IC7170→R3268	Pulse width modulation
R/W	IC7320→IC7324	µP read/write signal
RAD-	IC7105→CONN.1101	Radial actuator negative connection
RAD+	IC7105→CONN.1101	Radial actuator positive connection
RADINT	IC7170→R3111	Radial actuator integrator voltage.
REN	CONN.1101	Radial Error Normalized
RENSW	IC7170→R3124	Radial Error Normalized switch
RESEN	IC7170→IC7245 IC7170→IC7130	Reset encoder(CDCEP) and digital servo(DSICR)
RESET	IC7170→IC7210	Reset decoder CD60
RIGHTOUT	C2498→CONN.1400 C2498→CONN.1420 C2498→C2303	Analog right output
RSTHA	IC7325→IC7465	Reset high active, reset for DAIO

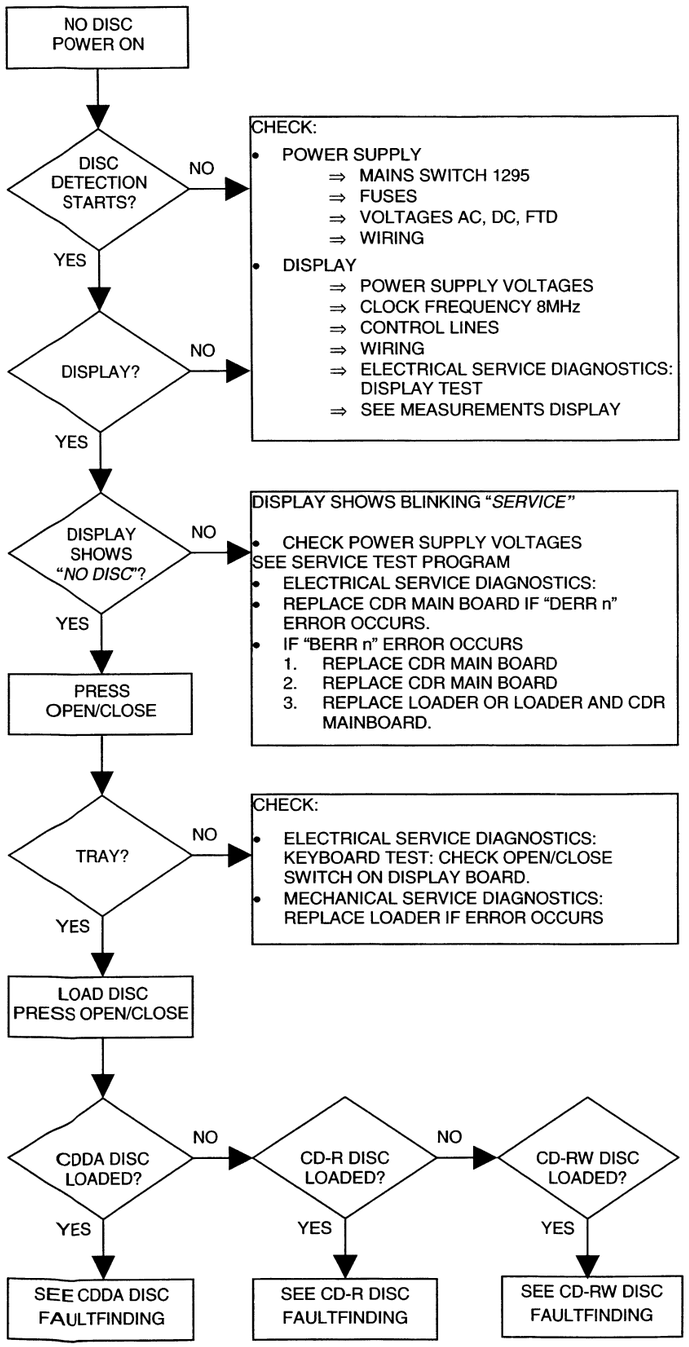
RSTIN	IC7320→IC7325	Reset microcontroller(from user µP)
RSTLA	IC7325→IC7440 IC7325→IC7170 IC7325→D6130 IC7325→CONN.1330	Reset low active, reset for GDIN, servo uP, DSD3, DSICR and display.
RXD	IC7320↔IC7325	Receive data of serial interface
SCL	IC7320↔L5300	I2C-bus clock for communication
SCLI	IC7320→T7326	I2C-bus clock Input to check "busy" of slave
SDA	IC7320↔L5300	I2C-bus data to display driver
SDAUX	IC7603→IC7440	Analog to digital converted data from ADC to DAI-O
SL-	IC7105→CONN.1101	Sledge motor negative connection
SL+	IC7105→CONN.1101	Sledge motor positive connection
STROBE	IC7320→IC7465 IC7320→CONN.1302	Control signal for DAI-O : data strobe
SWRT	IC7245→CONN.1102	Start Write 9ms(one shot at start up LWRT)
SYSCKLSW2	IC7320→IC7411	Control signal for system clock selection
SYSCLKSW1	IC7320→IC7411	Control signal for system clock selection
SYSSYNC	IC7170→CONN.1135	System synchronization
TLN	CONN.1101→IC7130	Track Loss Normalized
TRAYSW	CONN1380→IC7320	Control signal from CD loader (CDR765)
TRS1N	IC7170→CONN.1103	Tray sense
TXD	IC7320↔IC7325	Transmit data serial interface
UDAVAIL	IC7320→IC7465	User-data available
UNLOCK	IC7465→IC7320	Not locked on incoming EBU-signal
UNLOCK_GDIN	IC7323→R3435	Unlock signal to GDIN
V4	IC7210→CONN.1250	Versatile pin 4
VDC1	Supply voltage	Filament voltage for display
VDC2	Supply voltage	Filament voltage for display
VFTD	Supply voltage	Power supply for display
WCLK	IC7210→IC7245	Word clock
WSCDCEP	IC7260→IC7245	I2S word select to CDCEP
WSN2	CONN1360→ IC7260	I2S word select from CD player (CDR765)

7-1

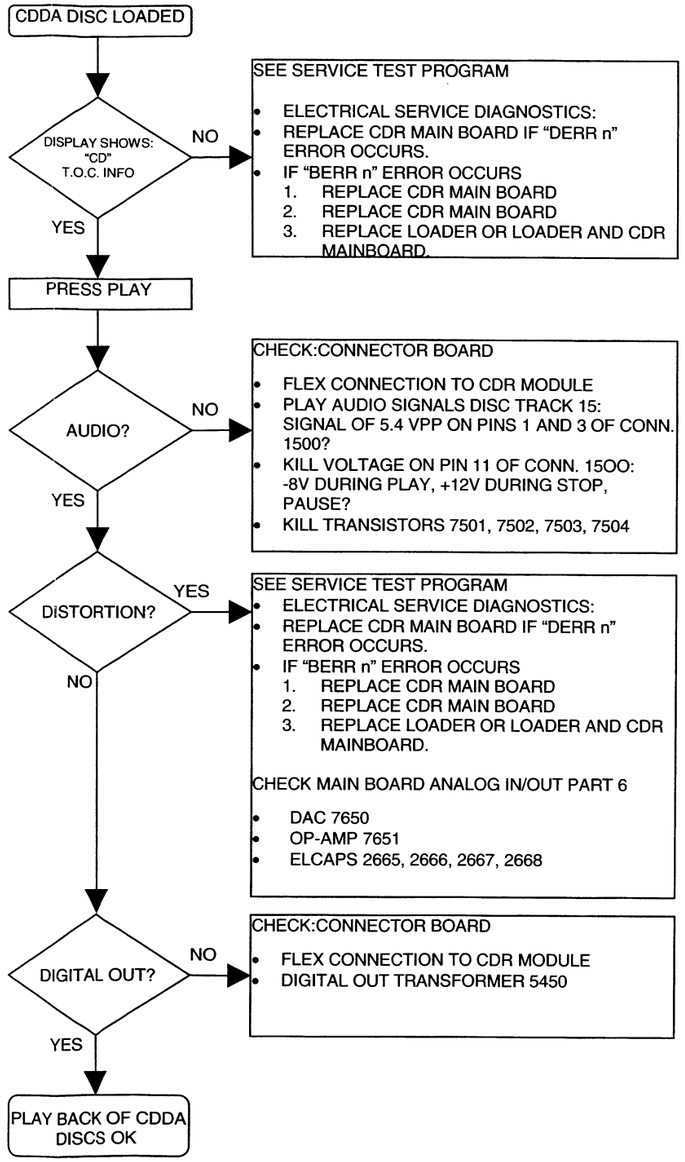
SERVICE TEST PROGRAM


If power ON, switch power OFF
DEALER DIAGNOSTICS (status of player) Press<PLAY> + <STOP> simultaneously and switch power on
Display shows blinking: "BUSY" during the test.
Set OK?
no
set displays: "ERROR"
yes
set displays: "PASSED"
to end test, switch power off
ELECTRICAL SERVICE DIAGNOSTICS (advice for replacement units) Load CDDA disc(SBC444A) Press<PLAY> + <NEXT> simultaneously and switch power on
MAIN BOARD DIAGNOSTIC
Display shows "player's name" briefly.
RAM TEST(7323)
Display shows "DTST1" during the test
Pass or fail
<NEXT> (test aborted)
ROM TEST(7322)
Display shows "DTST2" during the test
EEPROM TEST(IN 7320)
Display shows "DTST3" during the test
DAIO TEST(7465)
Display shows "DTST4" during the test
BASIC ENGINE DIAGNOSTIC
COMMUNICATION TEST (SPI BUS)
Display shows "BTST1" during the test
SELF TEST (NEC MICROPROCESSOR)
Display shows "BTST2" during the test
Tests OK?
no
set displays: "DERR n" or "BERR n
n = number of test
Result of aborted test will not be displayed
yes
set displays next failure
DISC TEST
DISC TEST
• Check of focus control
• Disc motor control
• Radial control
• Jump grooves control
REMARK: always pressing <NEXT> skips this test. Display message: "no CDDA"
Tests OK?
no
set displays: "BERR 3" "no CDDA" or "no DISC" if wrong disc or no disc is loaded
yes
set displays current disc time
Pass
DISPLAY TEST
All segments are blinking at a frequency of 1Hz.
KEYBOARD/REMOTE TEST
Display shows name of pressed key on keyboard or remote control.
To end test, switch power off.
MECHANICAL SERVICE DIAGNOSTICS (advice for replacement units) Press<PREV> + <NEXT> simultaneously and switch power on
FOCUS TEST
Display shows "BUSY" during the test
Visual inspection
<OPEN>
<CLOSE>
TRAY TEST
Visual inspection
Display shows "OPENED" even if tray is blocked
<PREV>
<NEXT>
SLEDGE TEST
Visual inspection
To end test, switch power off.
DC ERASE (erasement of complete disc) Load CD-RW disc Press <ERASE> + <RECORD> simultaneously and switch power on
Display shows: "ER mm:ss" during the erase function.
mm :remaining minutes
ss :remaining seconds
TOTAL and REM are also illuminated
Display shows: "PASSED" when the erase function is completed.
"ERROR" if DC ERASE fails.
switch power off.

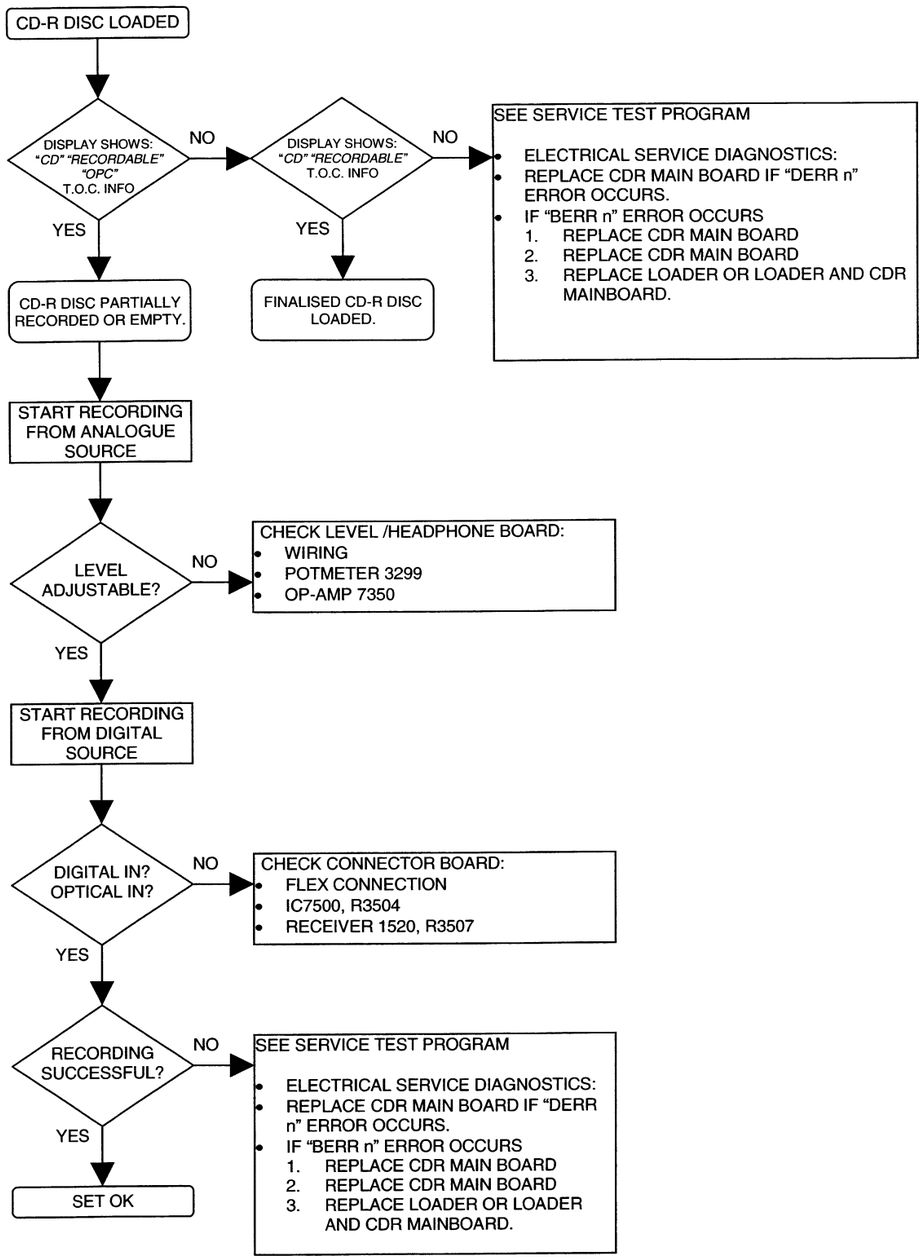
FAULTFINDING GUIDE



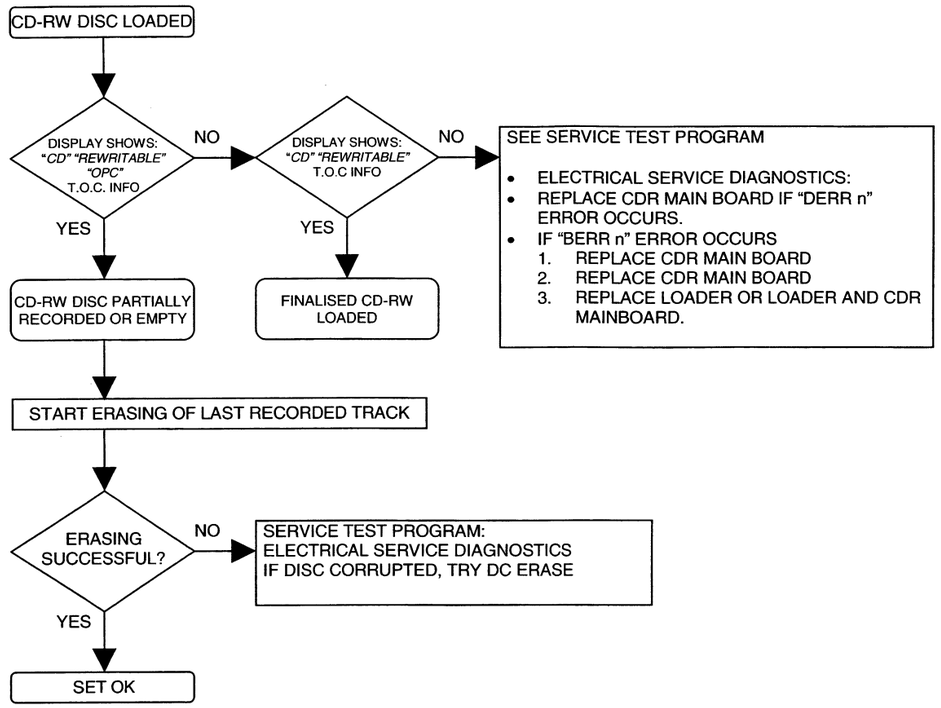
CDDA DISC FAULTFINDING GUIDE


CDDA DISC LOADED
DISPLAY SHOWS: "CD" T.O.C. INFO
NO
SEE SERVICE TEST PROGRAM
• ELECTRICAL SERVICE DIAGNOSTICS:
• REPLACE CDR MAIN BOARD IF "DERR n" ERROR OCCURS.
• IF "BERR n" ERROR OCCURS
1. REPLACE CDR MAIN BOARD
2. REPLACE CDR MAIN BOARD
3. REPLACE LOADER OR LOADER AND CDR MAINBOARD.
YES
PRESS PLAY
AUDIO?
NO
CHECK:CONNECTOR BOARD
• FLEX CONNECTION TO CDR MODULE
• PLAY AUDIO SIGNALS DISC TRACK 15: SIGNAL OF 5.4 VPP ON PINS 1 AND 3 OF CONN. 1500?
• KILL VOLTAGE ON PIN 11 OF CONN. 15OO: -8V DURING PLAY, +12V DURING STOP, PAUSE?
• KILL TRANSISTORS 7501, 7502, 7503, 7504
YES
DISTORTION?
YES
SEE SERVICE TEST PROGRAM
• ELECTRICAL SERVICE DIAGNOSTICS:
• REPLACE CDR MAIN BOARD IF "DERR n" ERROR OCCURS.
• IF "BERR n" ERROR OCCURS
1. REPLACE CDR MAIN BOARD
2. REPLACE CDR MAIN BOARD
3. REPLACE LOADER OR LOADER AND CDR MAINBOARD.
CHECK MAIN BOARD ANALOG IN/OUT PART 6
• DAC 7650
• OP-AMP 7651
• ELCAPS 2665, 2666, 2667, 2668
NO
DIGITAL OUT?
NO
CHECK:CONNECTOR BOARD
• FLEX CONNECTION TO CDR MODULE
• DIGITAL OUT TRANSFORMER 5450
YES
PLAY BACK OF CDDA DISCS OK

CD-R DISC FAULTFINDING



CD-RW DISC FAULTFINDING


CD-RW DISC LOADED
DISPLAY SHOWS: "CD" "REWRITABLE" "OPC" T.O.C. INFO
NO
DISPLAY SHOWS: "CD" "REWRITABLE" T.O.C INFO
NO
SEE SERVICE TEST PROGRAM
• ELECTRICAL SERVICE DIAGNOSTICS:
• REPLACE CDR MAIN BOARD IF "DERR n" ERROR OCCURS.
• IF "BERR n" ERROR OCCURS
1. REPLACE CDR MAIN BOARD
2. REPLACE CDR MAIN BOARD
3. REPLACE LOADER OR LOADER AND CDR MAINBOARD.
YES
YES
CD-RW DISC PARTIALLY RECORDED OR EMPTY
FINALISED CD-RW LOADED
START ERASING OF LAST RECORDED TRACK
ERASING SUCCESSFUL?
NO
SERVICE TEST PROGRAM:
ELECTRICAL SERVICE DIAGNOSTICS
IF DISC CORRUPTED, TRY DC ERASE
YES
SET OK

7-4

MEASUREMENTS DISPLAY PANEL

1. Measurement of voltage supplies.

Several voltages arrive at the display PCB.
Measurements and limits.

Voltage	Nominal value	Limits
VFTD	-26V	±5%
VDC1-DC2	3.5V	±10%
Vb	5V	±5%

2. Measurement of oscillator.

As clock driver for the display controller a resonator of 8Mhz is used.
The clock frequency is available at pin 8 of the display controller.
Check the frequency of 8Mhz ±5%.

3. Checking the control lines.

There are several lines which are inputs to the display controller and others which are outputs, these lines have to be checked to guarantee basic functionality.

RESETN:

This line should be kept low during power up for at least 3 machine cycles,with supply voltage within the operating range and oscillation stable.1 machine cycle = 12 X 1/Fc (8Mhz) Sec.

SDA and SCL:

The level on these two lines must be checked. When there is no communication they should have the 'High' level.

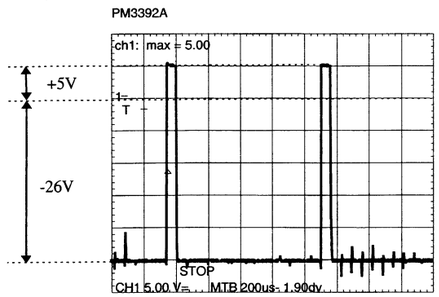
INTERRUPT:

The interrupt line is an output for the display controller. Check if this level is high after reset, no key pressed and no RC5 coming in.
Low pulses will be present when a key is pressed or when receiving RC5 commands from remote control.

Key matrix lines:

Check if at I/O port 4 of the controller all pins are high.(No keys pressed).(Pin 26 to 33). If not check respective pull-up resistors.

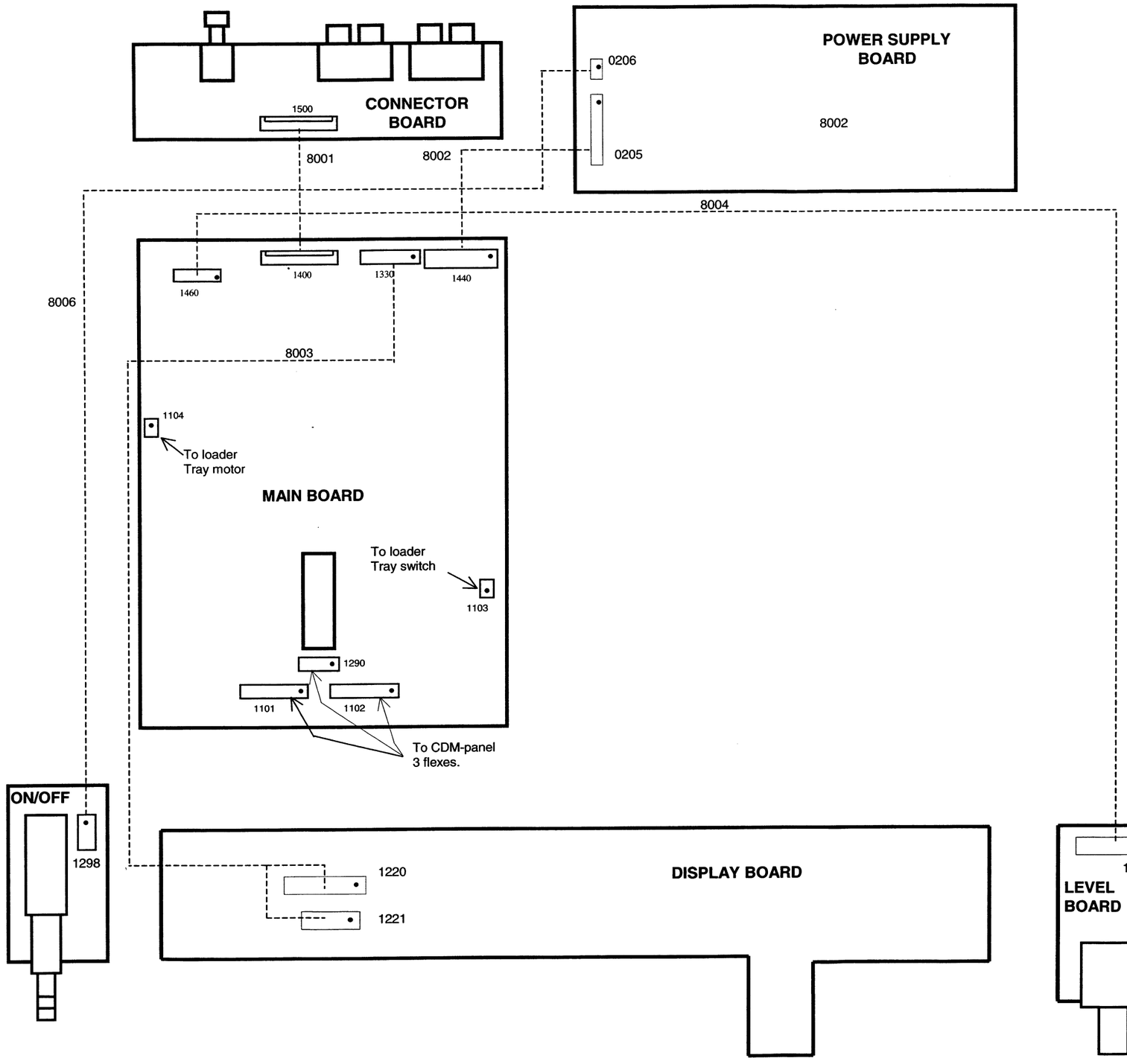
4. Operation of grid and segment control lines.



This figure shows the signal generated by the display processor on one of the grid lines. The level on the grid line changes from -26V to +5V.

The grid lines are scanned successively about every 950 µsec.

WIRING DIAGRAM CDR560/538



8-1

Pin 1 indicated by • All Wires are 1/1.

8001

1	
	RIGHTOUT
!	
2	GROUND
3	LEFTOUT!
4	LEFTIN!
5	GROUND
6	RIGHTIN!
7	GROUND
8	+5Vb!
9	LEFT2!
10	GROUND
11	KILL!
12	RIGHT2!
13	GROUND
14	DIGOUT!
15	DIGINEXT!
16	GROUND
17	OPTIN!
18	GROUND
19	EBUININT!
20	GROUND

8002

1	+5Vb!
2	+5VM!
3	+5Vb!
4	GROUND
5	GROUND
6	VDC2!
7	VFTD!
8	GROUND
9	+12V!
10	-8V!
11	VDC1!

8003

1	SDA!
2	SCL!
3	RSTLA!
4	GROUND
5	INTSLAVE!
6	VDC1!
7	VFTD!
8	VDC2!
9	+5Vb!
10	GROUND

8004

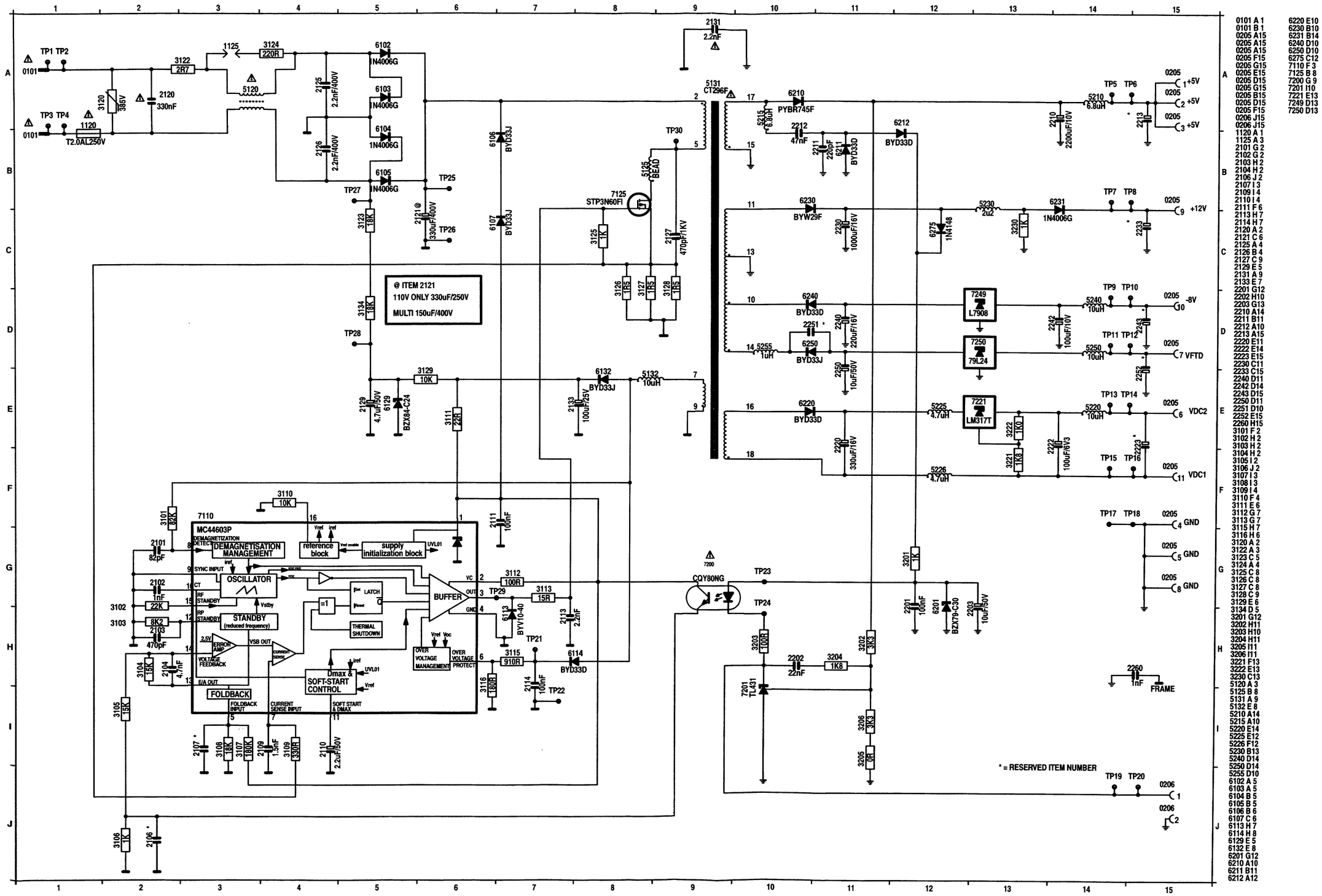
1	RIGHTTLEV!
2	GROUND
3	RIGHTFLEV!
4	-8Vb!
5	GROUND
6	+12Vb!
7	LEFTFLEV!
8	GROUND
9	LEFTTLEV!

8006

1	ON!
2	OFF!

9-1

POWER SUPPLY UNIT CIRCUIT DIAGRAM

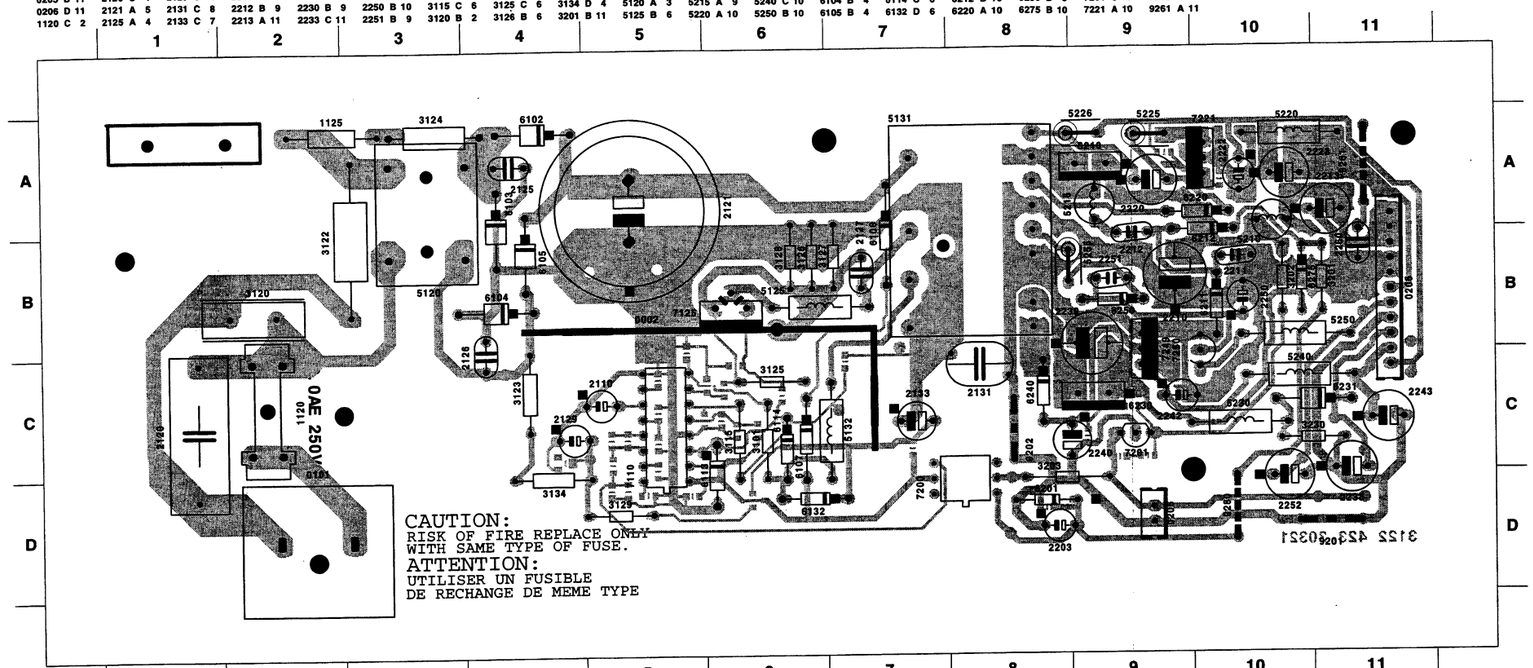


0101 A 1
0101 B 1
0205 A15
0205 A15
0205 A15
0205 F15
0205 G15
0205 E15
0205 D15
0205 G15
0205 B15
0205 D15
0205 F15
0206 J15
0206 J15
1120 A 1
1125 A 3
2101 G 2
2102 G 2
2103 H 2
2104 H 2
2106 J 2
2107 I 3
2109 I 4
2110 I 4
2111 F 6
2113 H 7
2114 H 7
2120 A 2
2121 C 6
2125 A 4
2126 B 4
2127 C 9
2129 E 5
2131 A 9
2133 E 7
2201 G12
2202 H10
2203 G13
2210 A14
2211 B11
2212 A10
2213 A15
2220 E11
2222 E14
2223 E15
2230 C11
2233 C15
2240 D11
2242 D14
2243 D15
2250 D11
2251 D10
2252 E15
2260 H15
3101 F 2
3102 H 2
3103 H 2
3104 H 2
3105 I 2
3106 J 2
3107 I 3
3108 I 3
3109 I 4
3110 F 4
3111 E 6
3112 G 7
3113 G 7
3115 H 7
3116 H 6
3120 A 2
3122 A 3
3123 C 5
3124 A 4
3125 C 8
3126 C 8
3127 C 8
3128 C 9
3129 E 6
3134 D 5
3201 G12
3202 H11
3203 H10
3204 H11
3205 I11
3206 I11
3221 F13
3222 E13
3230 C13
5120 A 3
5125 B 8
5131 A 9
5132 E 8
5210 A14
5215 A10
5220 E14
5225 E12
5226 F12
5230 B13
5240 D14
5250 D14
5255 D10
6102 A 5
6103 A 5
6104 B 5
6105 B 5
6106 B 6
6107 C 6
6113 H 7
6114 H 8
6129 E 5
6132 E 8
6201 G12
6210 A10
6211 B11
6212 A12
6220 E10
6230 B10
6231 B14
6240 D10
6250 D10
6275 C12
7110 F 3
7125 B 8
7200 G 9
7201 I10
7221 E13
7249 D13
7250 D13

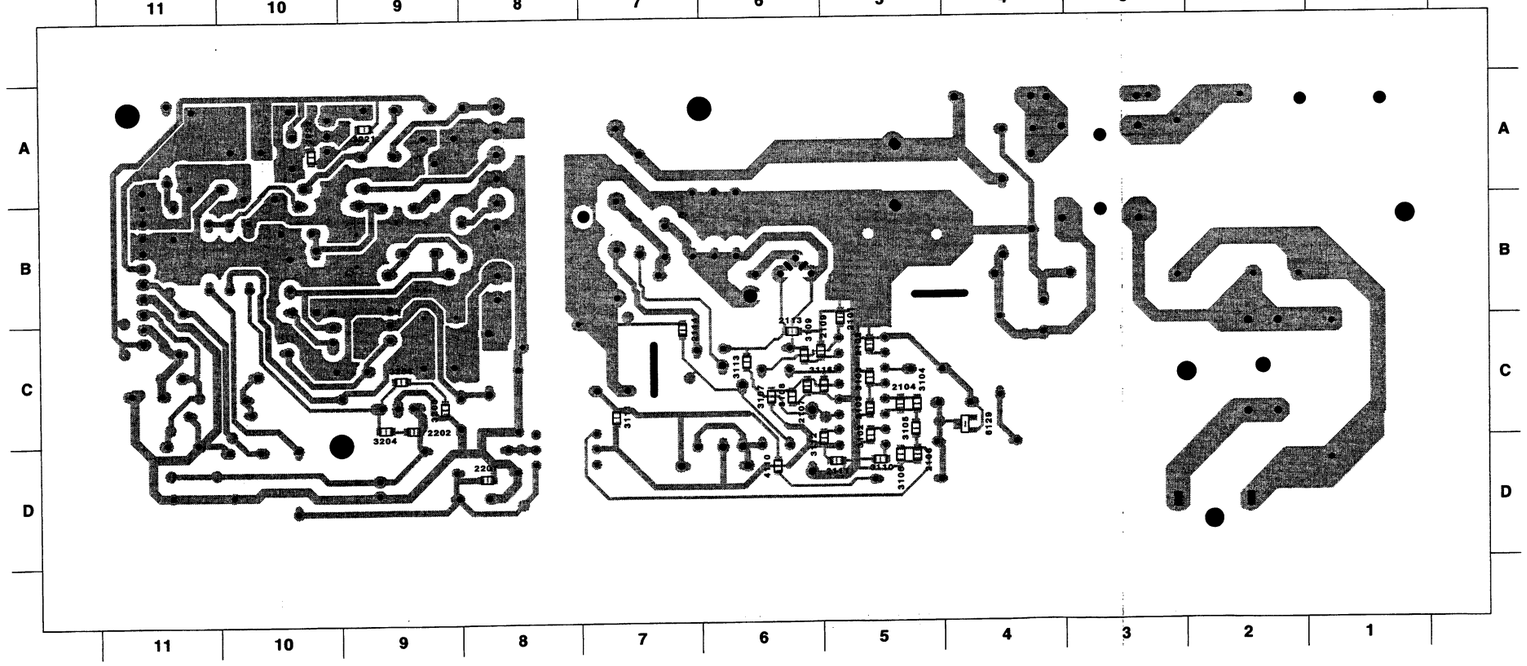
9-2

POWER SUPPLY UNIT BOARD

0002 B 6 1125 A 2 2126 B 4 2203 D 8 2220 A 9 2240 C 9 2252 D 10 3122 B 3 3127 B 7 3202 B 10 5131 B 8 5225 A 9 5255 B 8 6106 B 7 6201 D 8 6230 C 9 7110 C 5 7249 C 9 9280 D 10
0101 D 2 2110 C 5 2127 B 7 2210 B 9 2222 A 10 2242 C 9 2260 B 11 3123 C 4 3128 B 6 3203 D 8 5132 C 7 5226 A 9 6102 A 4 6107 C 6 6210 A 9 6231 C 10 7125 B 6 7250 C 10
0205 B 11 2120 C 1 2129 C 4 2211 B 10 2223 A 10 2243 C 11 3101 C 6 3124 A 3 3129 D 5 3230 C 10 5210 A 10 5230 C 10 6103 A 4 6113 D 6 6211 B 10 6240 C 8 7200 D 8 9201 D 11
0206 D 11 2121 A 5 2131 C 8 2212 B 9 2230 B 9 2250 B 10 3115 C 6 3125 C 6 3134 D 4 5120 A 3 5215 A 9 5240 C 10 6104 B 4 6114 C 6 6212 B 10 6250 B 9 7201 C 9 9202 C 8
1120 C 2 2125 A 4 2133 C 7 2213 A 11 2233 C 11 2251 B 9 3120 B 2 3126 B 6 3201 B 11 5125 B 6 5220 A 10 5250 B 10 6105 B 4 6132 D 6 6220 A 10 6275 B 10 7221 A 10 9261 A 11

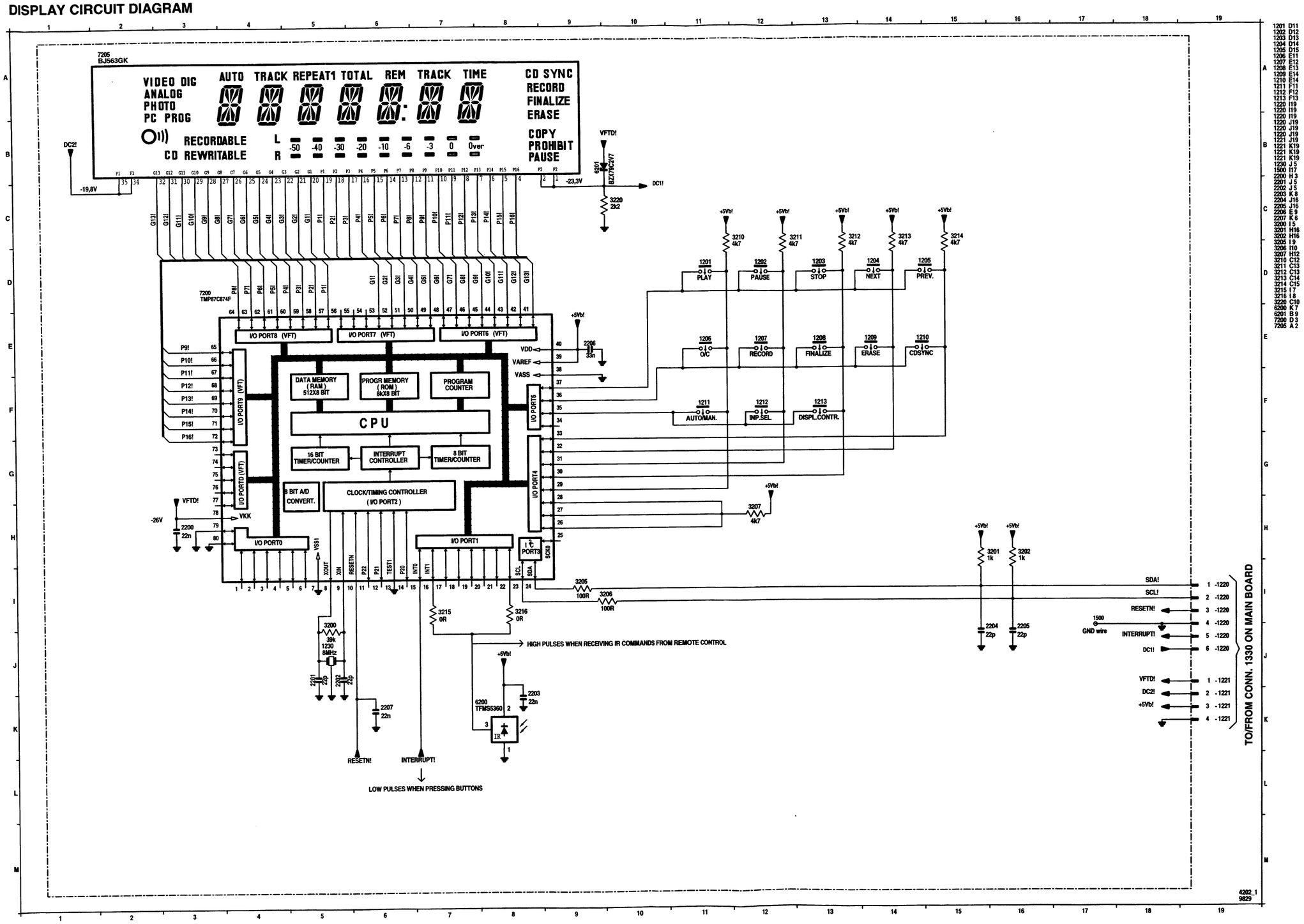


2101 B 5 2104 C 5 2109 C 6 2114 C 7 3102 C 5 3105 C 5 3108 C 6 3111 C 7 3116 C 5 3206 C 9 4110 D 6 TP2 D 2 TP5 B 11 TP8 C 11 TP11 C 10 TP14 A 11 TP17 B 11 TP20 D 11 TP23 D 8 TP26 B 5 TP29 C 5
2102 C 5 2106 D 5 2111 D 5 2201 D 8 3103 C 5 3106 D 5 3109 C 6 3112 C 5 3204 C 9 3221 A 9 6129 C 4 TP3 D 3 TP6 A 11 TP9 C 11 TP12 B 11 TP15 B 11 TP18 B 11 TP21 C 7 TP24 D 8 TP27 C 4 TP30 B 7
2103 C 5 2107 C 6 2113 C 6 2202 C 9 3104 C 5 3107 C 6 3110 D 5 3113 C 6 3205 C 9 3222 A 10 TP1 D 2 TP4 C 2 TP7 C 11 TP10 C 11 TP13 A 10 TP16 C 11 TP19 D 11 TP22 B 7 TP25 A 5 TP28 C 5



10-1

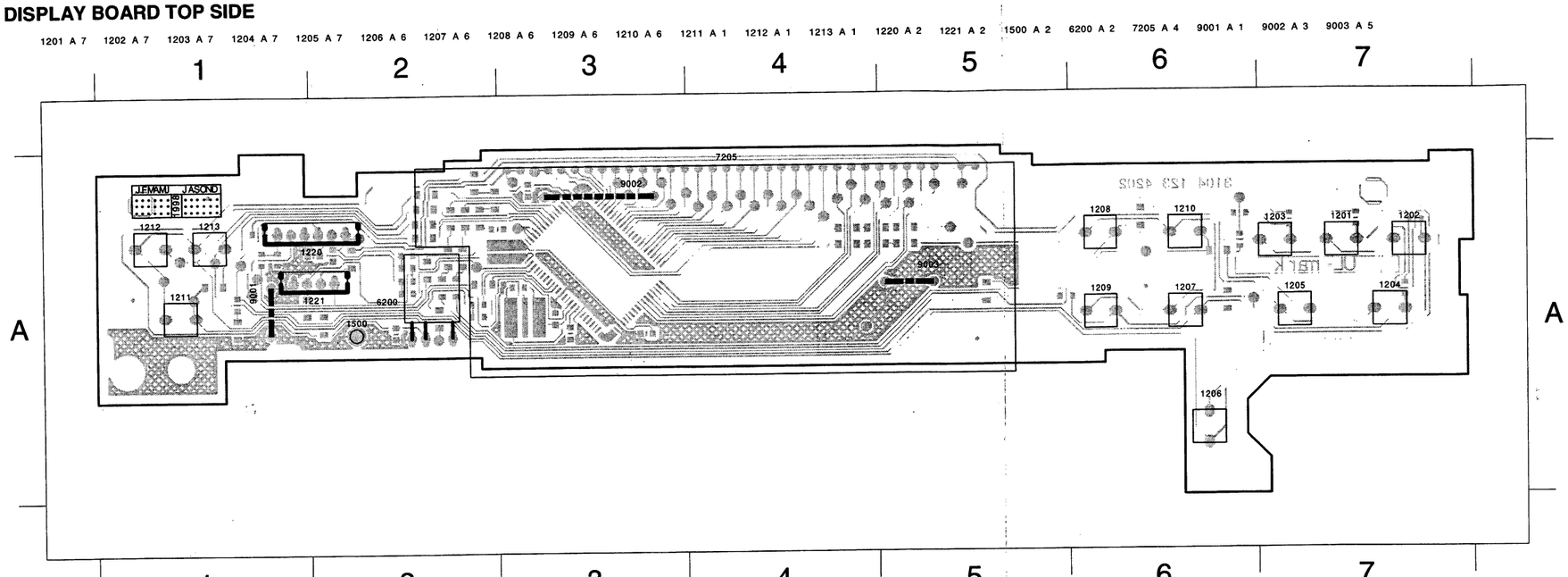
DISPLAY CIRCUIT DIAGRAM



10-2

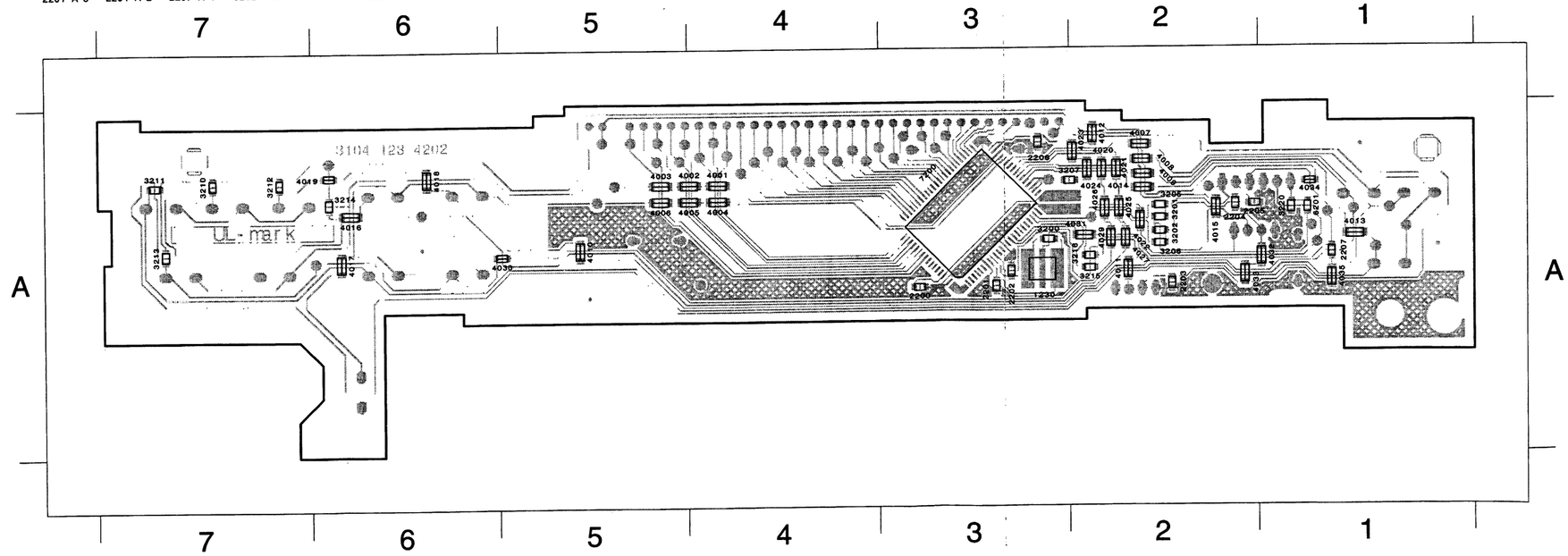
DISPLAY BOARD TOP SIDE

1201 A 7 1202 A 7 1203 A 7 1204 A 7 1205 A 7 1206 A 6 1207 A 6 1208 A 6 1209 A 6 1210 A 6 1211 A 1 1212 A 1 1213 A 1 1220 A 2 1221 A 2 1500 A 2 6200 A 2 7205 A 4 9001 A 1 9002 A 3 9003 A 5

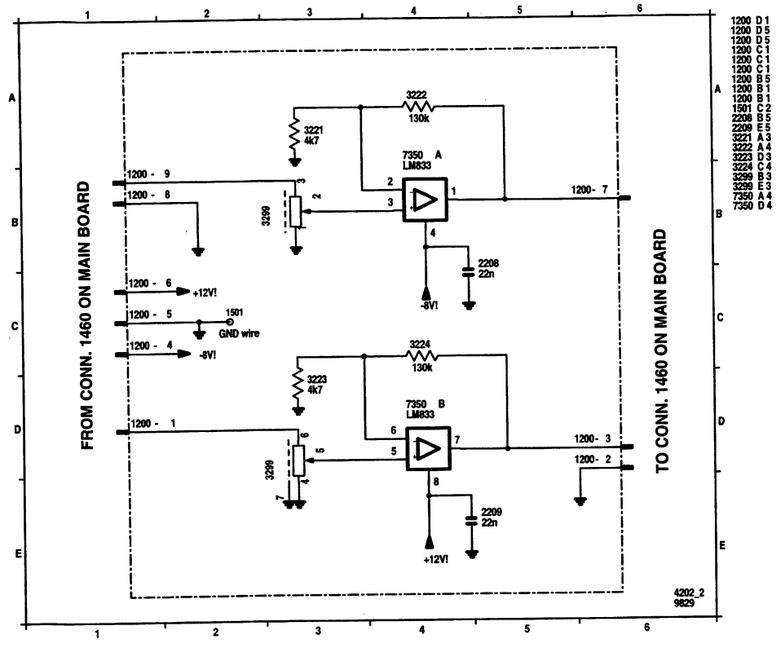


DISPLAY BOARD BOTTOM SIDE

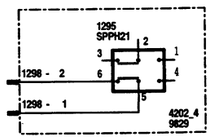
1230 A 3 2200 A 3 2201 A 3 2202 A 3 2203 A 2 2204 A 2 2205 A 2 2206 A 3 2207 A 1 3200 A 3 3201 A 2 3202 A 2 3205 A 2 3206 A 2 3207 A 2 3210 A 7 3211 A 7 3212 A 7 3213 A 7 3214 A 6 3215 A 2 3216 A 2 3220 A 1 4001 A 4 4002 A 4 4003 A 5 4004 A 4 4005 A 4 4006 A 5 4007 A 2 4008 A 2 4009 A 2 4010 A 5 4011 A 2 4012 A 2 4013 A 1 4014 A 2 4015 A 2 4016 A 6 4017 A 6 4018 A 6 4019 A 6 4020 A 2 4021 A 2 4022 A 2 4023 A 2 4024 A 2 4025 A 2 4026 A 2 4027 A 2 4029 A 2 4030 A 5 4031 A 2 4032 A 1 4033 A 2 4034 A 1 4035 A 1 6201 A 1 7200 A 3



LEVEL CIRCUIT DIAGRAM

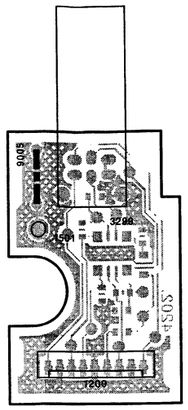


ON/OFF SWITCH BOARD

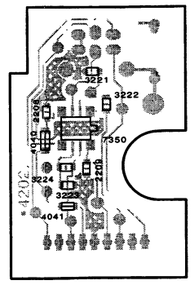


11-1

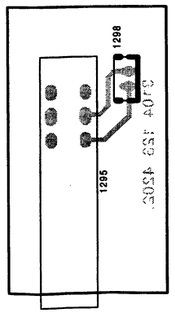
LEVEL BOARD TOPSIDE



BOTTOM SIDE



ON/OFF SWITCH BOARD



CDR MAIN BOARD

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1. SERVO PART CIRCUIT DIAGRAM 12-3
2. ENCODING AND DECODING PART CIRCUIT DIAGRAM 12-4
3. USER PROCESSOR PART CIRCUIT DIAGRAM 12-5
4. DIGITAL IN/OUT PART CIRCUIT DIAGRAM 12-6
5. CONNECTOR PART CIRCUIT DIAGRAM AND PCB DRAWINGS 12-7
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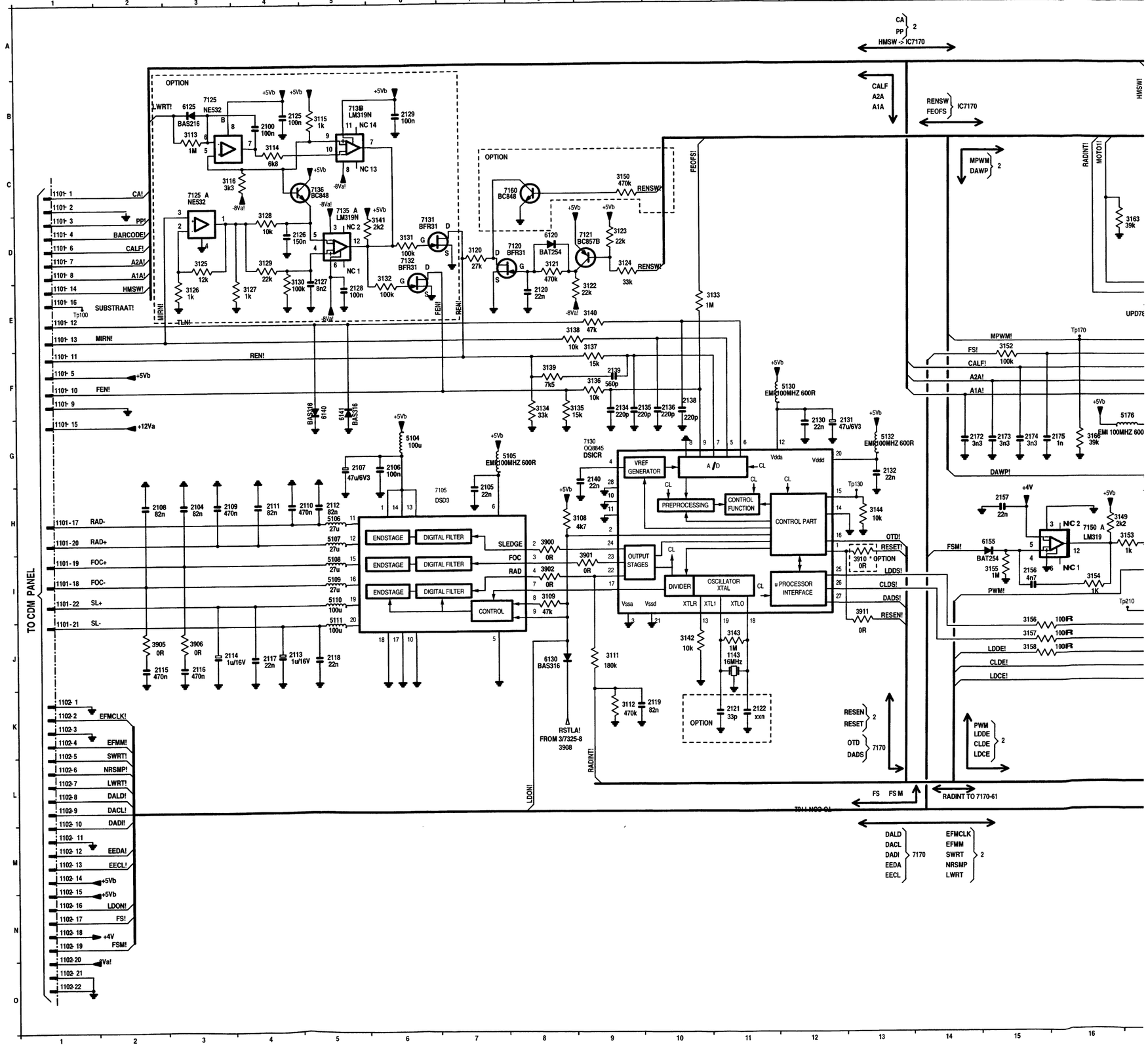
7. CDR MAINBOARD TOPSIDE PCB DRAWING 12-9
8. CDR MAINBOARD BOTTOM SIDE PCB DRAWING 12-10

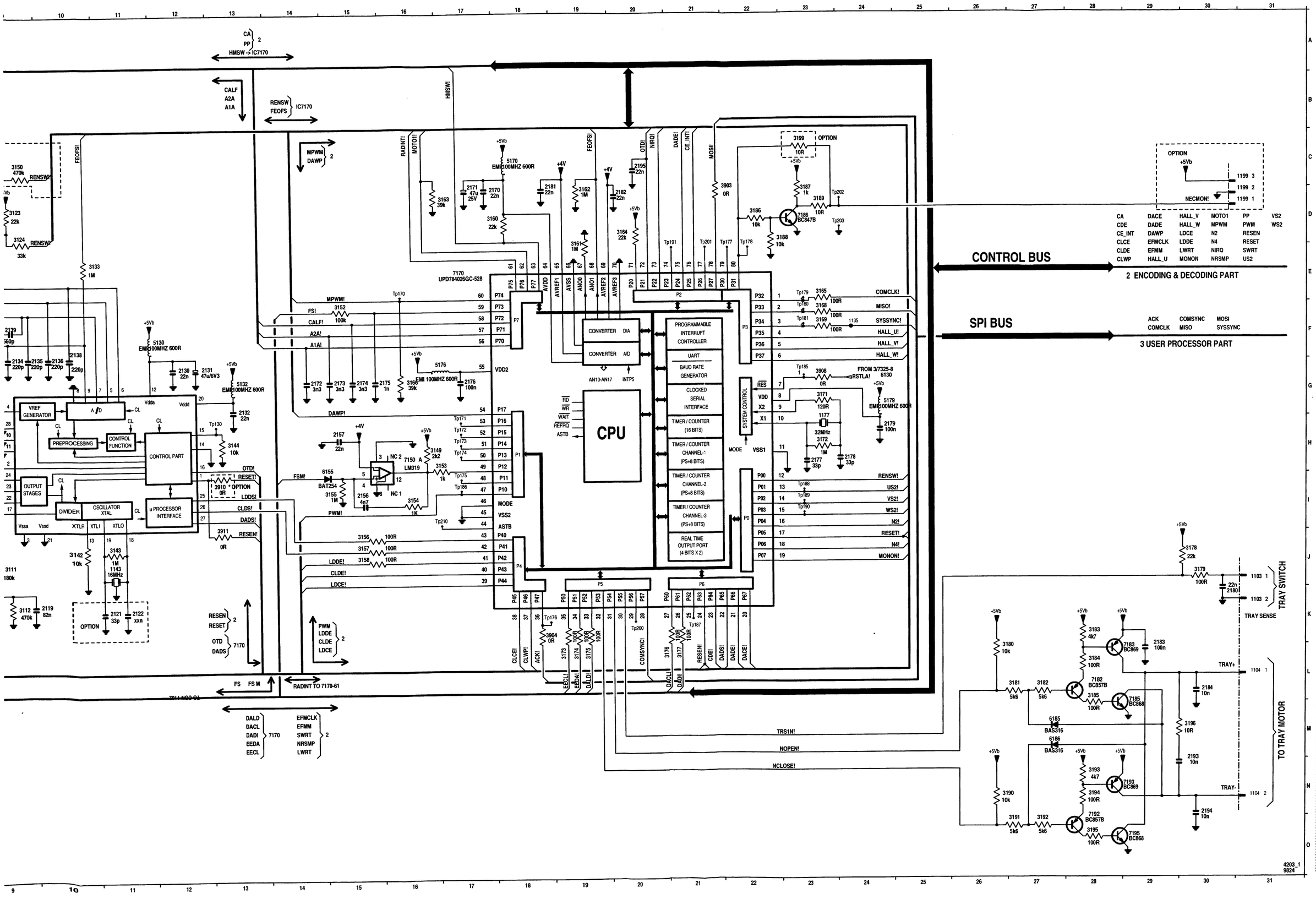
TECHNICIAN NOTES

12-3

1. SERVO PART

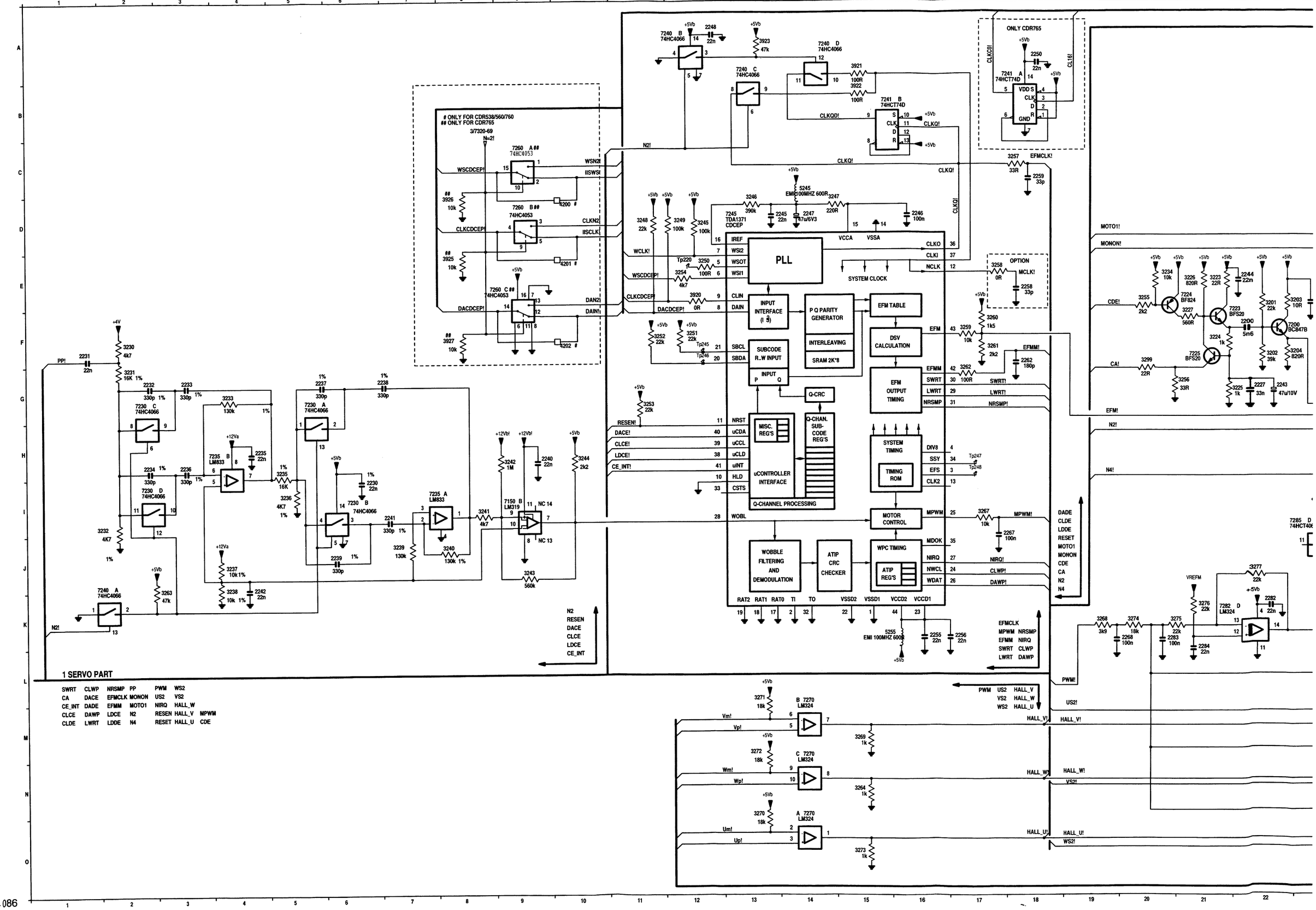


12-3

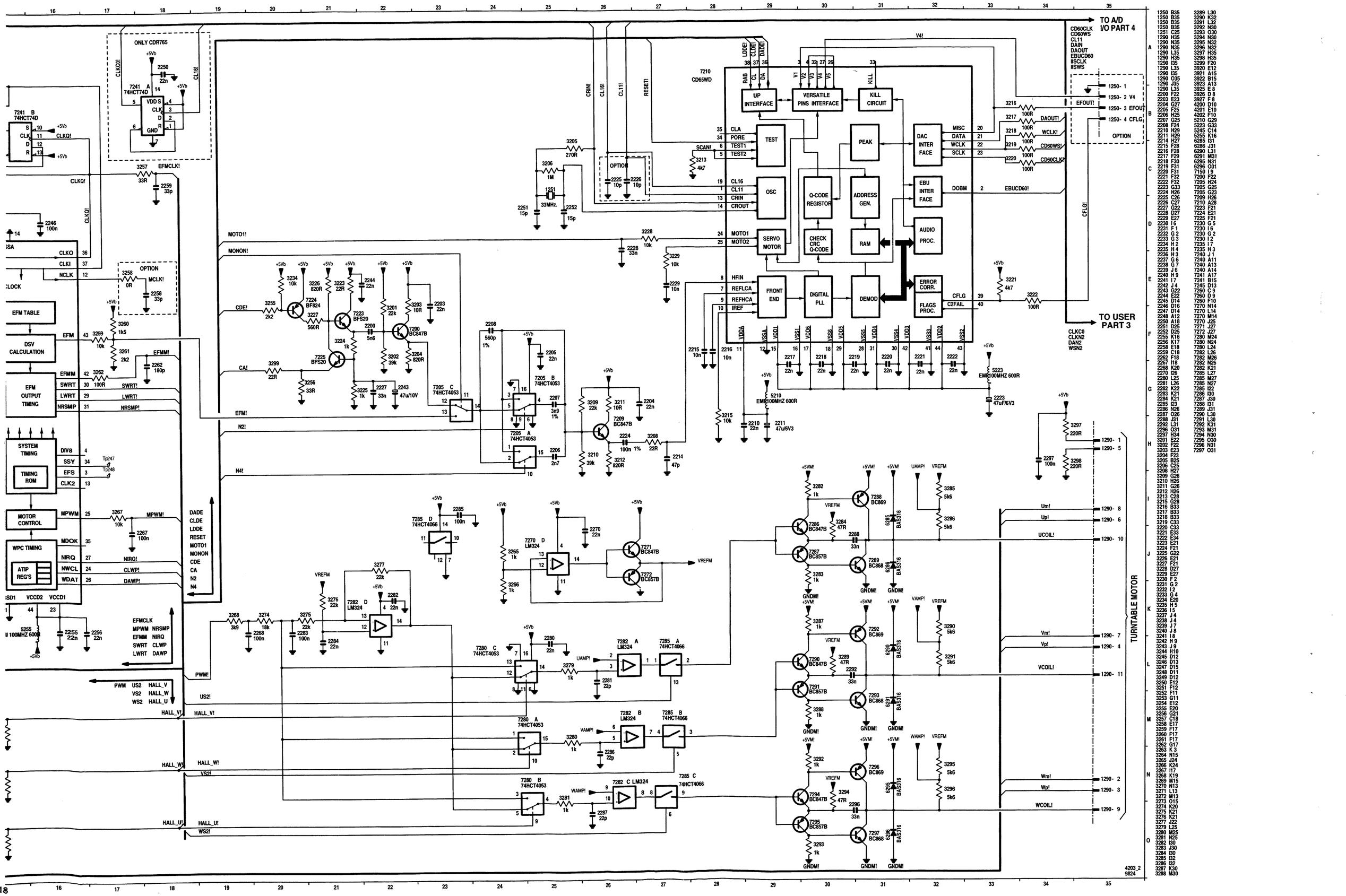

CA
PP
2
HMSW -> IC7170
CALF
A2A
A1A
RENSW
FEOFS
IC7170
HMSW!
MPWM
DAWP
2
RADINT!
MOTO1!
FEOFS!
OTDI
NIRQI
DADEI
CE_INT!
MOSI!
3199
OPTION
10R
+5Vb
3187
1k
3189
10R
Tp202
3186
10k
7186
BC847B
Tp203
3188
10k
Tp191
Tp201
Tp177
Tp178
3903
0R
3163
39k
3160
22k
3161
1M
3164
22k
2171
47u
25V
2170
22n
5170
EMI100MHZ 600R
2181
22n
3162
1M
2182
22n
2195
22n
7170
UPD784026GC-528
P75
P76
P77
AVDD
AVREF1
AVSS
AN00
AN01
AVREF2
AVREF3
P20
P21
P22
P23
P24
P25
P26
P27
P30
P31
P2
P7
MPWM!
FS!
CALF!
A2A!
A1A!
3152
100k
Tp170
2172
3n3
2173
3n3
2174
3n3
2175
1n
3165
39k
5176
EMI 100MHZ 600R
2176
100n
DAWP!
VDD2
P17
P16
P15
P14
P13
P12
P11
P10
MODE
VSS2
ASTB
P40
P41
P42
P43
P44
P1
P4
CONVERTER D/A
CONVERTER A/D
AN10-AN17
INTP5
PROGRAMMABLE INTERRUPT CONTROLLER
UART
BAUD RATE GENERATOR
CLOCKED SERIAL INTERFACE
TIMER / COUNTER (16 BITS)
TIMER / COUNTER CHANNEL-1 (PS+8 BITS)
TIMER / COUNTER CHANNEL-2 (PS+8 BITS)
TIMER / COUNTER CHANNEL-3 (PS+8 BITS)
REAL TIME OUTPUT PORT (4 BITS X 2)
RD
WR
WAIT
REFRQ
ASTB
CPU
SYSTEM CONTROL
MODE
VSS1
RES
VDD
X2
X1
P00
P01
P02
P03
P04
P05
P06
P07
P0
P32
P33
P34
P35
P36
P37
P3
COMCLK!
MISO!
SYSSYNC!
HALL_U!
HALL_V!
HALL_W!
3165
100R
3168
100R
3169
100R
1135
Tp179
Tp180
Tp181
3908
0R
FROM 3/7325-8
RSTLA!
6130
3171
120R
1177
32MHz
3172
1M
2177
33p
2178
33p
5179
EMI100MHZ 600R
2179
100n
3198
OPTION
+5Vb
1199 3
1199 2
1199 1
NECMON!
CONTROL BUS
2 ENCODING & DECODING PART
CA DACE HALL_V MOTO1 PP VS2
CDE DADE HALL_W MPWM PWM WS2
CE_INT DAWP LDCE N2 RESEN
CLCE EFMCLK LDDE N4 RESET
CLDE EFMM LWRT NIRQ SWRT
CLWP HALL_U MONON NRSMP US2
SPI BUS
3 USER PROCESSOR PART
ACK COMSYNC MOSI
COMCLK MISO SYSSYNC
3133
1M
3150
470k
RENSW!
3123
22k
3124
33k
RENSW!
2139
560p
2134
220p
2135
220p
2136
220p
2138
220p
5130
EMI100MHZ 600R
2130
22n
2131
47u/6V3
5132
EMI100MHZ 600R
2132
22n
VREF GENERATOR
A/D
Vdda
Vddd
CL
PREPROCESSING
CONTROL FUNCTION
CONTROL PART
OUTPUT STAGES
DIVIDER
OSCILLATOR XTAL
u PROCESSOR INTERFACE
Vssa
Vssd
XTLR
XTLI
XTLO
Tp130
3144
10k
OTD!
RESET!
3910
0R
OPTION
LDDS!
CLDS!
DADS!
3911
RESEN!
0R
3142
10k
3143
1M
1143
16MHz
3111
180k
3112
470k
2119
82n
OPTION
2121
33p
2122
xxn
2157
22n
+4V
NC 2
7150 A
LM319
NC 1
3149
2k2
3153
1k
6155
BAT254
FSM!
3155
1M
2156
4n7
3154
1K
PWM!
Tp210
3156
100R
3157
100R
3158
100R
LDDE!
CLDE!
LDCE!
RESEN
RESET
OTD
DADS
2
7170
PWM
LDDE
CLDE
LDCE
2
FS
FS M
RADINT TO 7170-61
DALD
DACL
DADI
EEDA
EECL
7170
EFMCLK
EFMM
SWRT
NRSMP
LWRT
2
TRS1N!
NOPEN!
NCLOSE!
3178
22k
3179
100R
22n
2180
1103 1
1103 2
TRAY SWITCH
TRAY SENSE
3180
10k
3181
5k6
3182
5k6
3183
4k7
7183
BC869
2183
100n
3184
100R
7182
BC857B
7185
BC868
3185
100R
2184
10n
6185
BAS316
6186
BAS316
3196
10R
2193
10n
TRAY+
TRAY-
1104 1
1104 2
TO TRAY MOTOR
3190
10k
3191
5k6
3192
5k6
3193
4k7
7193
BC869
3194
100R
7192
BC857B
7195
BC868
3195
100R
2194
10n
4203_1
9824

12-4

2. ENCODING & DECODING PART

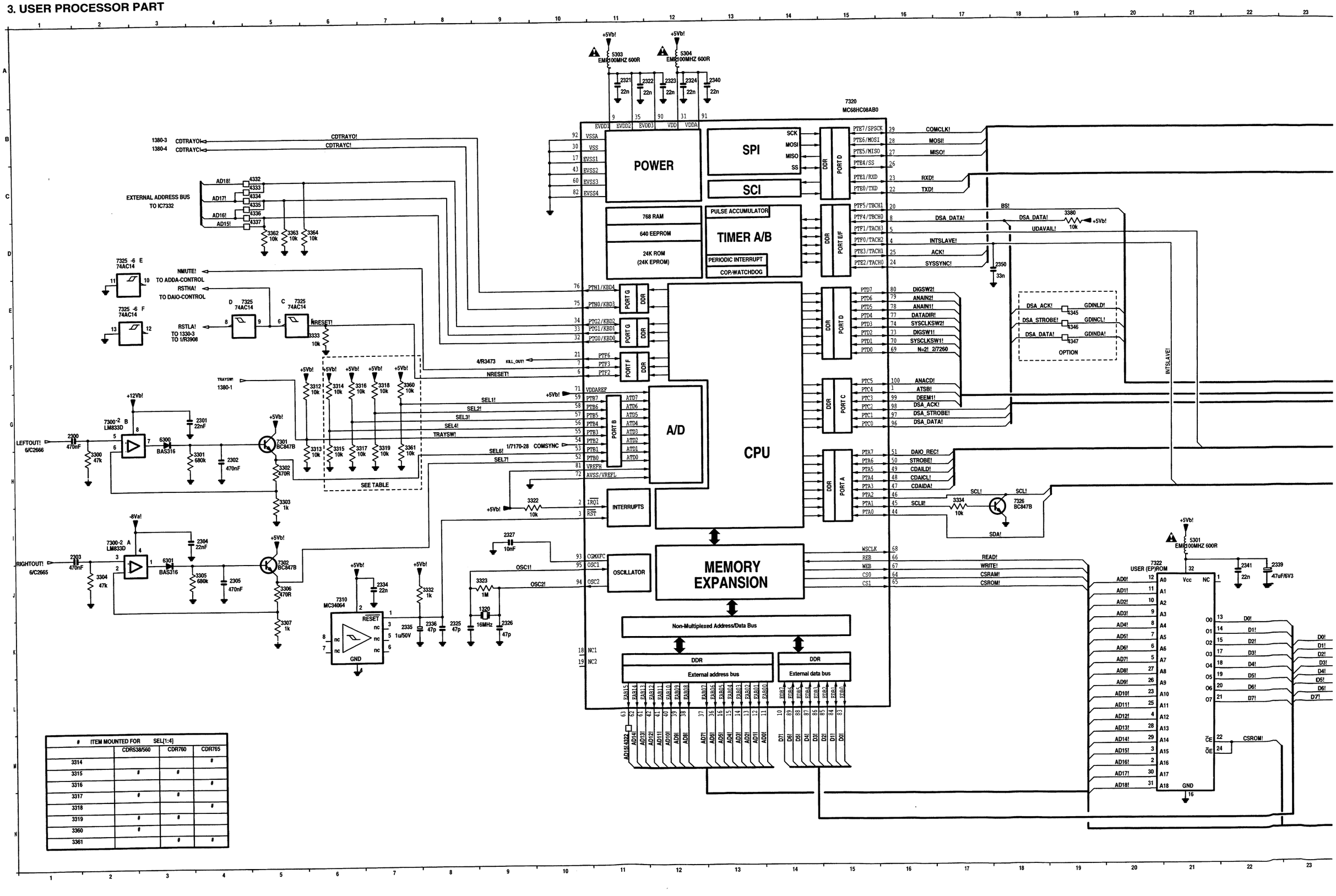


12-4


ONLY CDR765
7241 A 74HCT74D
7241 B 74HCT74D
CLKO!
CL16!
EFMCLK!
CLKO
CLKI
NCLK
OPTION
MCLK!
EFM TABLE
DSV CALCULATION
EFM
EFMM
SWRT
LWRT
NRSMP
EFM OUTPUT TIMING
SWRT!
LWRT!
NRSMP!
EFMM!
SYSTEM TIMING
TIMING ROM
DIV8
SSY
EFS
CLK2
MOTOR CONTROL
MPWM
MDOK
MPWM!
WPC TIMING
ATIP REG'S
NIRQ
NWCL
WDAT
NIRQ!
CLWP!
DAWP!
VCCD2
VCCD1
EFMCLK
MPWM NRSMP
EFMM NIRQ
SWRT CLWP
LWRT DAWP
PWM US2 HALL_V
VS2 HALL_W
WS2 HALL_U
DADE
CLDE
LDDE
RESET
MOTO1
MONON
CDE
CA
N2
N4
CRIN!
CL16!
CL11!
RESET!
7210 CD65WD
UP INTERFACE
VERSATILE PINS INTERFACE
KILL CIRCUIT
TEST
OSC
SERVO MOTOR
FRONT END
DIGITAL PLL
DEMOD
PEAK
Q-CODE REGISTOR
CHECK CRC Q-CODE
ADDRESS GEN.
RAM
DAC INTER FACE
EBU INTER FACE
AUDIO PROC.
ERROR CORR.
FLAGS PROC.
MOTO1!
MONON!
CDE!
CA!
EFM!
N2!
N4!
TO A/D I/O PART 4
TO USER PART 3
CD60CLK
CD60WS
CL11
DAIN
DAOUT
EBUCD60
IISCLK
IISWS
EFOUT!
DAOUT!
WCLK!
CD60WS!
CD60CLK!
EBUCD60!
CFLG!
C2FAIL
CLKO
CLKN2
DAN2
WSN2
TURNTABLE MOTOR
Um!
Up!
UCOIL!
Vm!
Vp!
VCOIL!
Wm!
Wp!
WCOIL!
4203_2
9824

12-5

3. USER PROCESSOR PART



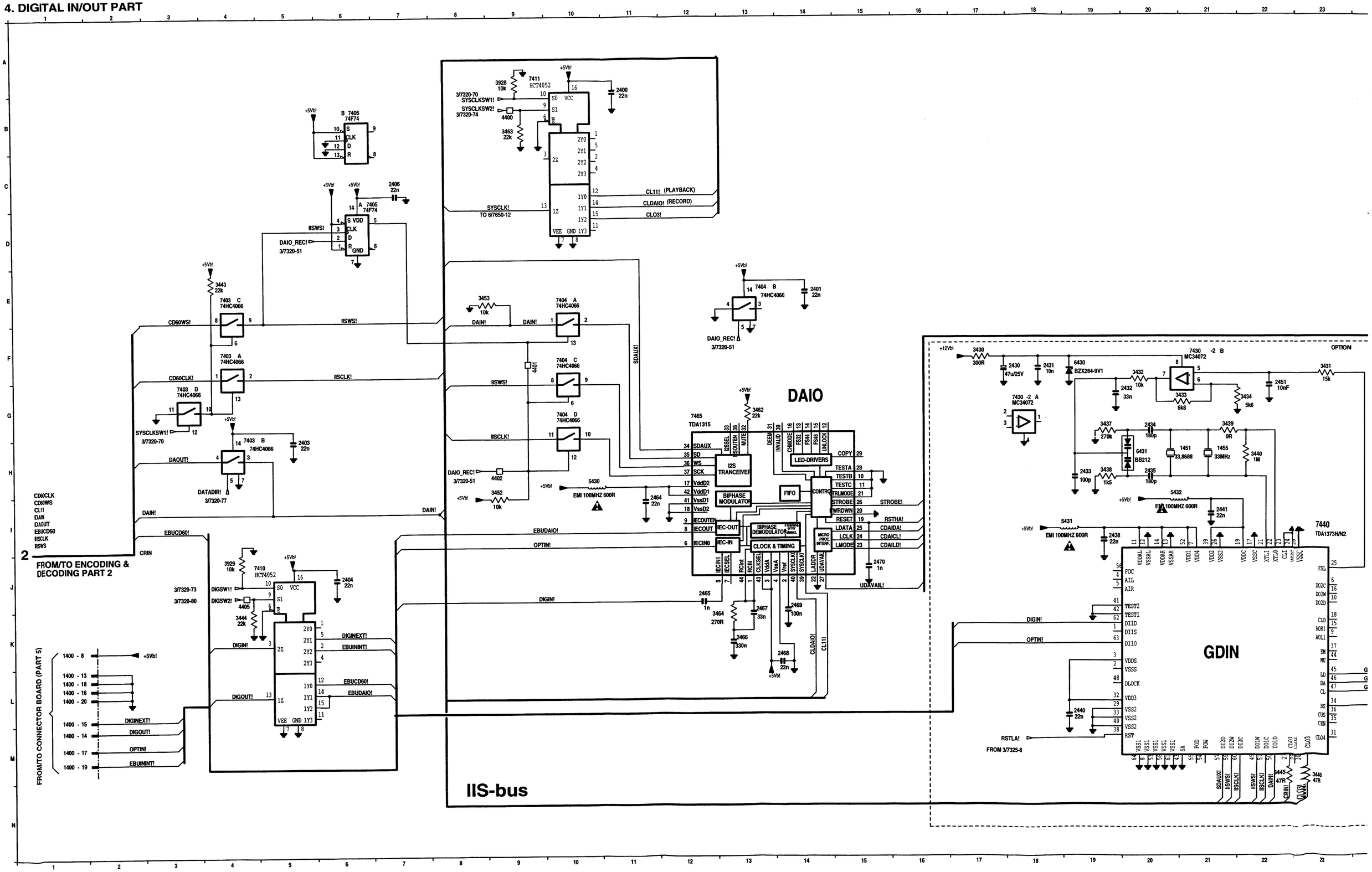
#	ITEM MOUNTED FOR SEL[1:4]		
	CDR538/560	CDR760	CDR765
3314			#
3315	#	#	
3316			#
3317	#	#	
3318			#
3319	#	#	
3360	#		
3361		#	#

12-5

+5Vb! 5303 EMI100MHZ 600R 2321 22n 2322 22n 2323 22n 2324 22n 2340 22n
+5Vb! 5304 EMI100MHZ 600R
EVDD1 EVDD2 EVDD3 VDD VDDA
VSSA VSS EVSS1 EVSS2 EVSS3 EVSS4
POWER
7320 MC68HC08AB0
SPI SCK MOSI MISO SS
SCI
768 RAM
640 EEPROM
24K ROM (24K EPROM)
PULSE ACCUMULATOR
TIMER A/B
PERIODIC INTERRUPT
COP/WATCHDOG
PORT D DDR
PORT E/F DDR
PORT G DDR
PORT F DDR
PORT B DDR
PORT C DDR
PORT A DDR
A/D
CPU
INTERRUPTS
OSCILLATOR
MEMORY EXPANSION
Non-Multiplexed Address/Data Bus
DDR External address bus
DDR External data bus
PTE7/SPSCK COMCLK!
PTE6/MOSI MOSI!
PTE5/MISO MISO!
PTE4/SS
PTE1/RXD RXD!
PTE0/TXD TXD!
PTF5/TBCH1 BS!
PTF4/TBCH0 DSA_DATA!
PTF1/TACH3 UDAVAIL!
PTF0/TACH2 INTSLAVE!
PTE3/TACH1 ACK!
PTE2/TACH0 SYSSYNC!
2350 33n
3380 10k +5Vb!
PTH1/KBD4 PTH0/KBD3 PTG2/KBD2 PTG1/KBD1 PTG0/KBD0
PTF6 PTF3 PTF2
PTD7 DIGSW2!
PTD6 ANAIN2!
PTD5 ANAIN1!
PTD4 DATADIR!
PTD3 SYSCLKSW2!
PTD2 DIGSW1!
PTD1 SYSCLKSW1!
PTD0 N=2! 2/7260
DSA_ACK! 4345 GDINLD!
DSA_STROBE! 4346 GDINCL!
DSA_DATA! 4347 GDINDA!
OPTION
PTC5 ANACD!
PTC4 ATSB!
PTC3 DEEM1!
PTC2 DSA_ACK!
PTC1 DSA_STROBE!
PTC0 DSA_DATA!
PTA7 DAIO_REC!
PTA6 STROBE!
PTA5 CDAILD!
PTA4 CDAICL!
PTA3 CDAIDA!
PTA2
PTA1 SCLII!
PTA0
3334 10k SCL! 7326 BC847B SCL! SDA!
VDDAREF VREFH AVSS/VREFL
PTB7 PTB6 PTB5 PTB4 PTB3 PTB2 PTB1 PTB0
ATD7 ATD6 ATD5 ATD4 ATD3 ATD2 ATD1 ATD0
3322 10k IRQ1 RST
CGMXFC OSC1 OSC2
OSC1! OSC2!
WSCLK REB WEB CS0 CS1
READ! WRITE! CSRAM! CSROM!
NC1 NC2
EXTAB15 EXTAB14 EXTAB13 EXTAB12 EXTAB11 EXTAB10 EXTAB9 EXTAB8 EXTAB7 EXTAB6 EXTAB5 EXTAB4 EXTAB3 EXTAB2 EXTAB1 EXTAB0
EXTDB7 EXTDB6 EXTDB5 EXTDB4 EXTDB3 EXTDB2 EXTDB1 EXTDB0
AD15/4322 AD14! AD13! AD12! AD11! AD10! AD9! AD8! AD7! AD6! AD5! AD4! AD3! AD2! AD1! AD0!
D7! D6! D5! D4! D3! D2! D1! D0!
7322 USER (EP)ROM AD0! AD1! AD2! AD3! AD4! AD5! AD6! AD7! AD8! AD9! AD10! AD11! AD12! AD13! AD14! AD15! AD16! AD17! AD18! Vcc NC GND ČE ŌE D0! D1! D2! D3! D4! D5! D6! D7! CSROM!
+5Vb! 5301 EMI100MHZ 600R 2341 22n 2339 47uF/6V3
+5Vb! 5302 EMI100MHZ 600R 2342 22n
7323 CY6264-70SNC VCC G ET WT READ! CSRAM! WRITE! GND
7325 -A MC74HC14AD 2329 22n 3330 100R 2330 100n
7325 -B MC74HC14AD RXD! 3327 10k 3326 100k -8Va! 3328 6k8
3350 4k7 +5Vb! TXD!
SPI BUS
1
GDIN-control 4
ADDA-control 4-6
DSA-control CD PART
DAIO-control 4
I2C BUS
OPTION 7320-55 TRAYSW! 7320-76 CDTRAYO! 7320-75 CDTRAYC!
1380 - 1 1380 - 2 1380 - 3 1380 - 4
Tp300 Tp301 Tp302
1301- 1 1301- 2 1301- 3
SERIAL INTERFACE
1360 - 22 1360 - 20 1360 - 21 1360 - 19 1360 - 18 1360 - 17 1360 - 16 1360 - 15 1360 - 14 1360 - 13 1360 - 12 1360 - 11 1360 - 10 1360 - 9 1360 - 8 1360 - 7 1360 - 6 1360 - 5 1360 - 4 1360 - 3 1360 - 2 1360 - 1
DSA_DATA! DSA_STROBE! DSA_ACK! +12Vb! +5Vb! CLKN2! WSN2! DAN2! EBUININT! RSTHA! LEFT2! RIGHT2! -8Va! CLKC0!
TO CONN.1200 ON CD MAIN BOARD
5310 NFM39R10C102 SDA! 1330- 1
5311 NFM39R10C102 SCL! 1330- 2
5312 NFM39R10C102 VDC1! 1330- 6
5313 NFM39R10C102 VDC2! 1330- 8
5314 NFM39R10C102 VFTD! 1330- 7
5315 NFM39R10C102 +5Vb! 1330- 9
7325-8 RSTLA! 1330- 10 1330- 3 1330- 4 1330- 5 INTSLAVE!
TO DISPLAY
4203_3 9824

12-6

4. DIGITAL IN/OUT PART



12-6

DAI-O-control 3

GDIN_control 3

DAIO

GDIN

OPTION

7440
TDA1373H/N2

7465
TDA1315

7404 A 74HC4066
7404 B 74HC4066
7404 C 74HC4066
7404 D 74HC4066

7430 -2 A MC34072
7430 -2 B MC34072

I2S TRANCEIVER
BIPHASE MODULATOR
BIPHASE DEMODULATOR
CLOCK & TIMING
FIFO
CONTROL
LED-DRIVERS
MICRO PROC. INTERF.

EMI 100MHZ 600R
EMI 100MHZ 30R

DAIO_REC!
3/7320-51

CL11! (PLAYBACK)
CLDAIO! (RECORD)
CLO3!

TO 6/R3671,3672
FROM 3/7320-21
KILL_OUT!

FROM 3/7325-8
RSTLA!
DIGIN!
OPTIN!

GDINLD!
GDINDA!
GDINCL!
BS!

FROM CONN. 0205 ON POWER SUPPLY

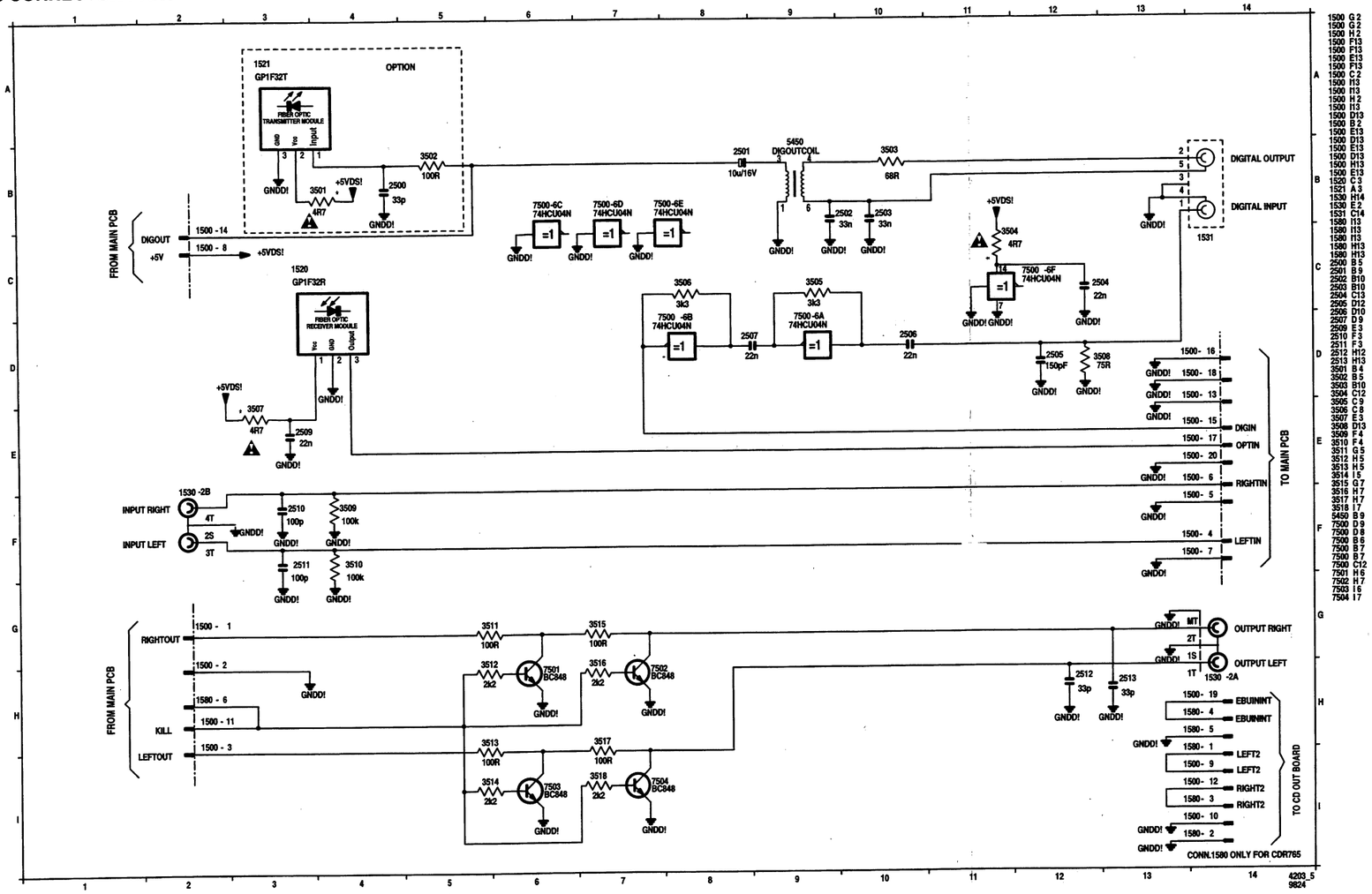
1440 - 1
1440 - 2
1440 - 3
1440 - 4
1440 - 5
1440 - 6
1440 - 7
1440 - 8
1440 - 9
1440 - 10
1440 - 11

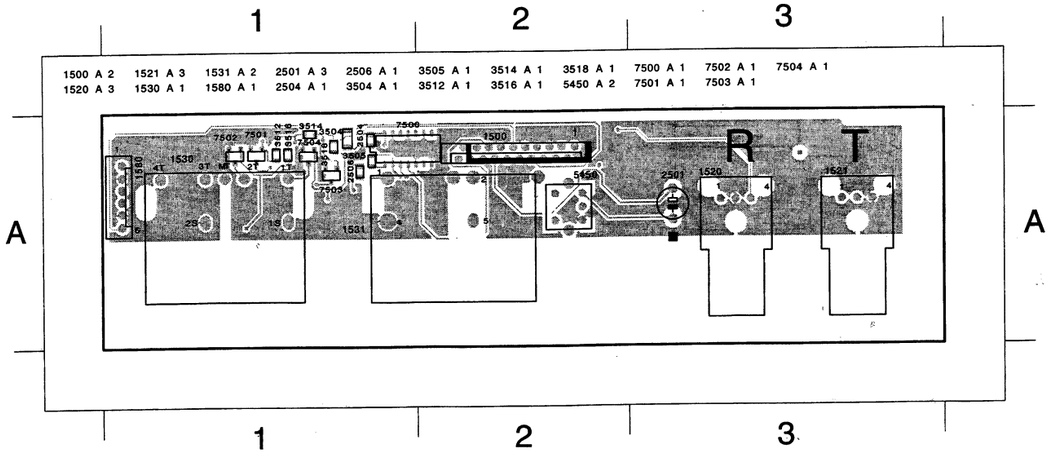
VDC2!
VFTD!
VDC1!

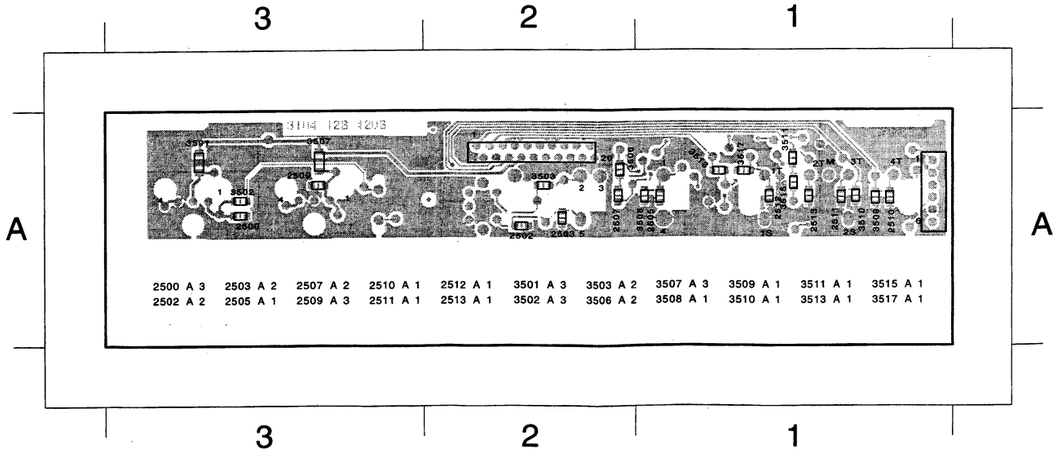
4203_4
9824

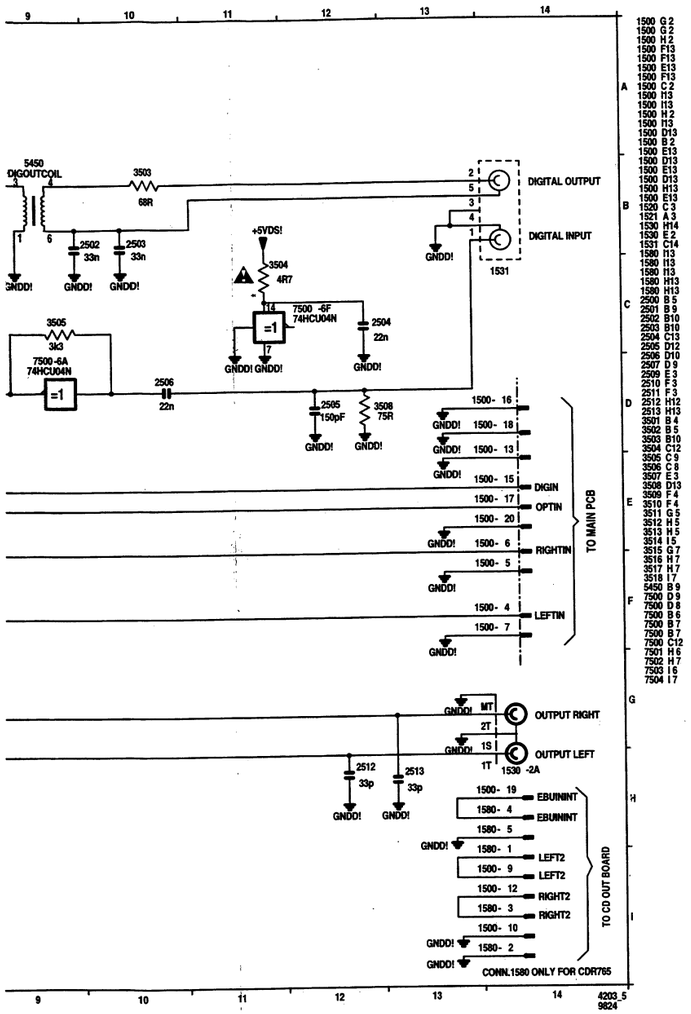
12-7

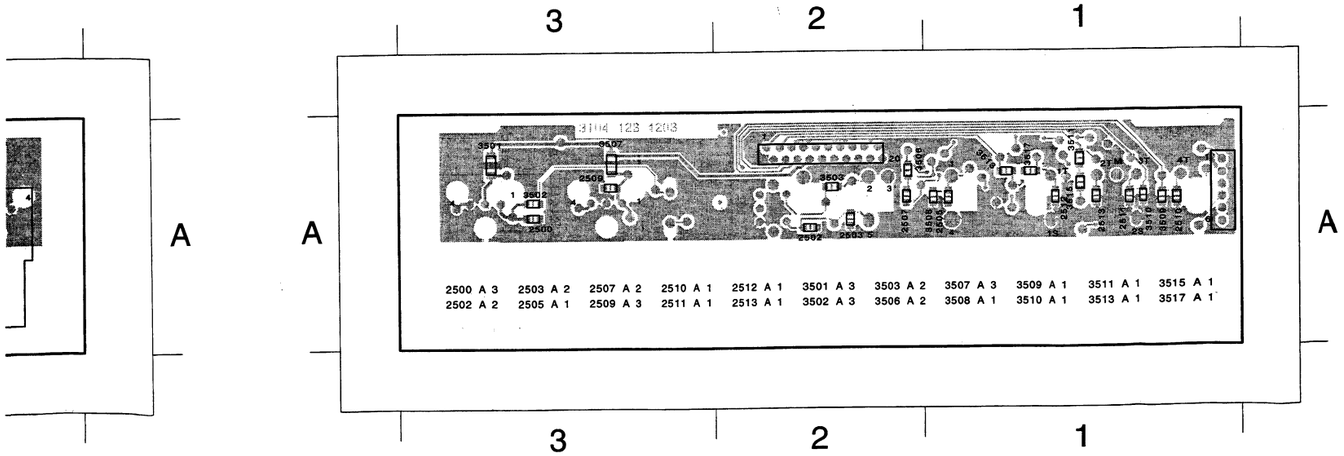
5 CONNECTOR PART





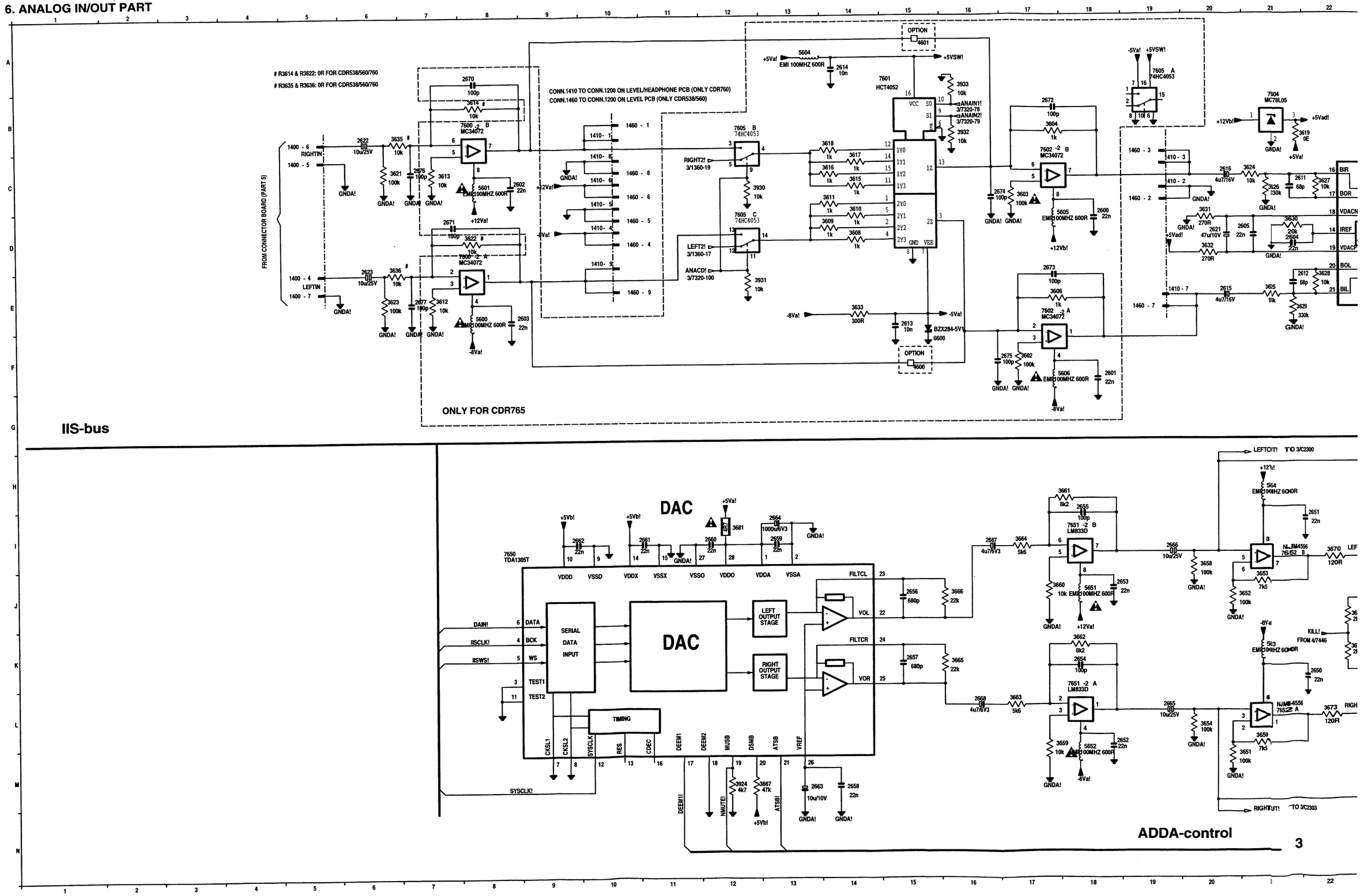



5450
DIGOUTCOIL
3503
68R
2502
33n
2503
33n
GNDD!
+5VDS!
3504
4R7
7500 -5F
74HCU04N
2504
22n
3505
3k3
7500-6A
74HCU04N
2506
22n
2505
150pF
3508
75R
DIGITAL OUTPUT
DIGITAL INPUT
1531
1500- 16
1500- 18
1500- 13
1500- 15
DIGIN
1500- 17
OPTIN
1500- 20
1500- 6
RIGHTIN
1500- 5
1500- 4
LEFTIN
1500- 7
TO MAIN PCB
MT
OUTPUT RIGHT
2T
1S
OUTPUT LEFT
1T
1530 -2A
2512
33p
2513
33p
1500- 19
EBUININT
1580- 4
EBUININT
1580- 5
1580- 1
LEFT2
1500- 9
LEFT2
1500- 12
RIGHT2
1580- 3
RIGHT2
1500- 10
1580- 2
TO CD OUT BOARD
CONN.1580 ONLY FOR CDR765
4203.5
9824


3
2
1
A
2500 A 3
2502 A 2
2503 A 2
2505 A 1
2507 A 2
2509 A 3
2510 A 1
2511 A 1
2512 A 1
2513 A 1
3501 A 3
3502 A 3
3503 A 2
3506 A 2
3507 A 3
3508 A 1
3509 A 1
3510 A 1
3511 A 1
3513 A 1
3515 A 1
3517 A 1

12-8

6. ANALOG IN/OUT PART



12-8

CONN.1410 TO CONN.1200 ON LEVEL/HEADPHONE PCB (ONLY CDR760)
CONN.1460 TO CONN.1200 ON LEVEL PCB (ONLY CDR538/560)

CDR765

ADC

DAC

SERIAL DATA INPUT

TIMING

LEFT OUTPUT STAGE

RIGHT OUTPUT STAGE

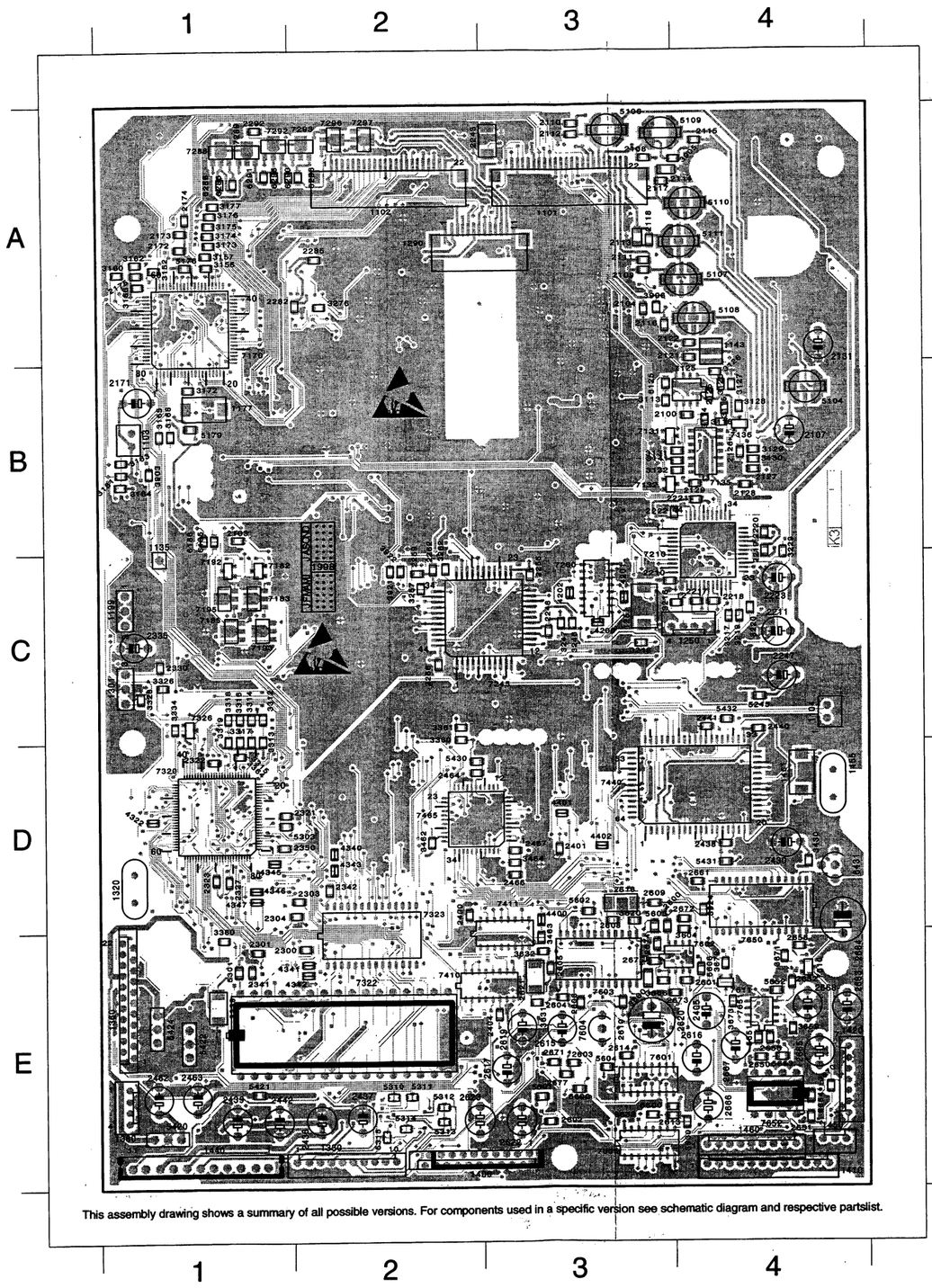
ADDA-control

3

CONN.1400 TO CONN.1500 ON CONNECTOR PCB (PART 5)
CONN.1410 TO CONN.1200 ON LEVEL/HEADPHONE PCB (ONLY CDR760)
CONN.1420: OPTION
CONN.1450 TO CONN.1280 ON HEADPHONE PCB (ONLY CDR765)

12-9

CDR MAINBOARD TOP SIDE

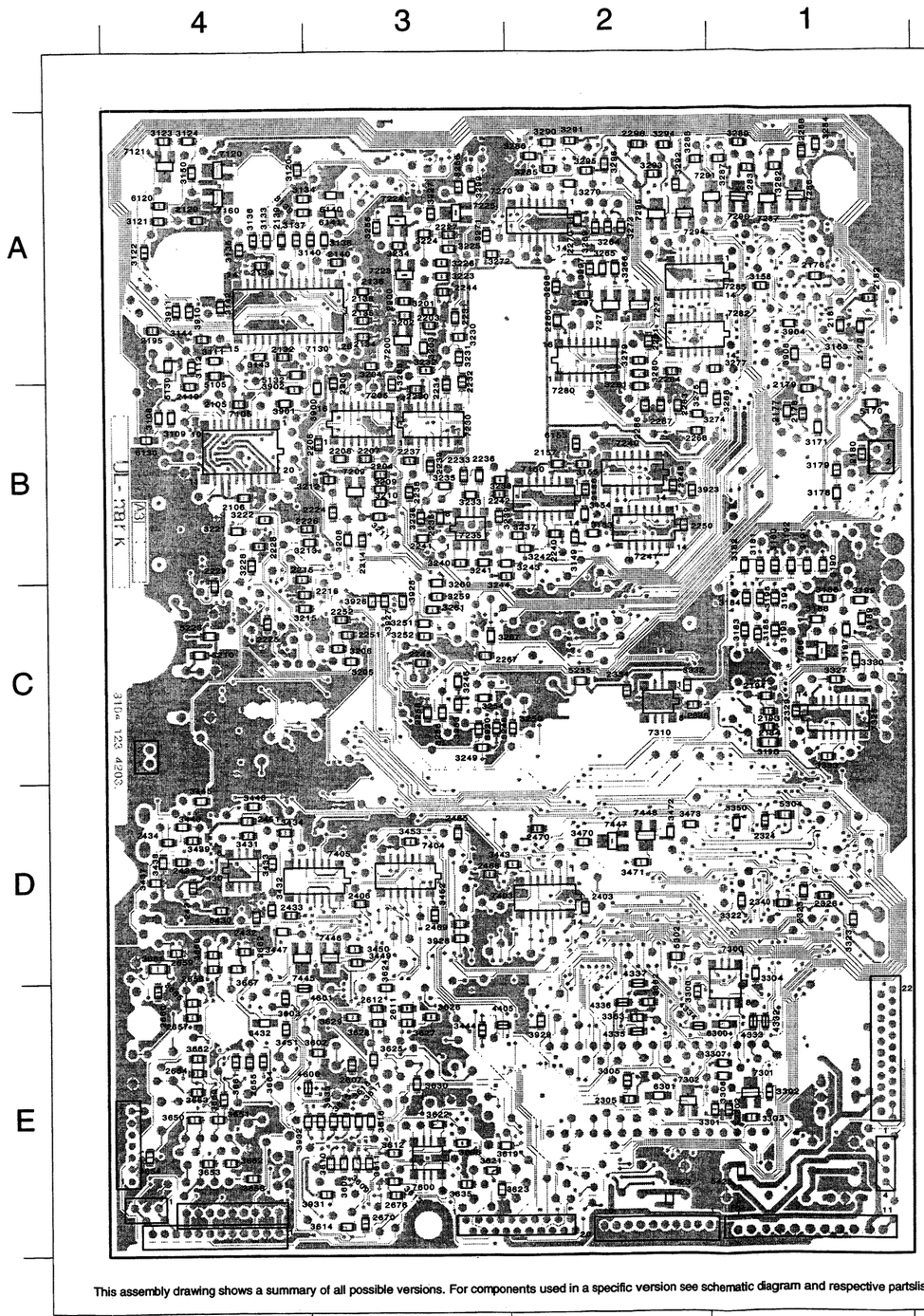


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective partslist.

1101 A 3	2438 D 4	3314 C 1	6295 A 2
1102 A 2	2439 E 1	3315 C 1	6296 A 2
1103 B 1	2440 C 4	3316 C 1	6431 D 4
1104 C 4	2441 C 4	3317 C 1	6600 E 3
1135 C 1	2442 E 1	3318 C 1	7125 B 4
1143 A 4	2462 E 1	3319 C 1	7131 B 3
1177 B 1	2463 E 1	3326 C 1	7132 B 3
1199 C 1	2464 D 2	3328 C 1	7135 B 4
1250 C 4	2466 D 3	3334 C 1	7136 B 4
1251 C 3	2467 D 3	3360 C 2	7170 A 1
1290 A 2	2600 D 3	3361 C 2	7182 C 1
1301 C 1	2601 E 4	3364 D 1	7183 C 1
1320 D 1	2602 E 3	3380 E 1	7185 C 1
1330 E 2	2603 E 3	3430 D 4	7192 C 1
1360 E 1	2604 E 3	3462 D 2	7193 C 1
1380 E 1	2605 E 3	3463 E 3	7195 C 1
1400 E 2	2606 E 3	3464 D 3	7210 C 4
1410 E 4	2608 D 3	3604 E 4	7245 C 3
1420 E 4	2609 D 3	3606 E 3	7260 C 3
1440 E 1	2610 E 3	3620 D 3	7288 A 1
1450 E 4	2613 E 3	3631 E 3	7289 A 1
1451 D 4	2614 E 3	3632 E 3	7292 A 1
1455 D 4	2615 E 3	3633 E 3	7293 A 2
1460 E 4	2616 E 4	3659 E 4	7296 A 2
2100 B 4	2617 E 3	3670 E 4	7297 A 2
2104 A 3	2618 D 3	3671 E 4	7320 D 1
2107 B 4	2619 E 3	3672 E 4	7322 E 2
2108 A 3	2620 E 3	3673 E 4	7323 E 2
2109 A 3	2621 E 3	3680 E 3	7326 C 1
2110 A 3	2622 E 3	3903 B 1	7410 E 3
2111 A 3	2623 E 2	3905 A 4	7411 E 3
2112 A 3	2650 E 4	3906 A 3	7440 D 4
2113 A 3	2651 E 4	3921 C 2	7465 D 2
2114 A 3	2652 E 4	3922 C 2	7601 E 3
2115 A 4	2653 E 4	3924 D 4	7602 E 4
2116 A 3	2658 E 4	3930 E 4	7603 E 3
2117 A 3	2661 D 4	4200 C 3	7604 E 3
2118 A 3	2663 E 4	4201 C 3	7605 E 3
2121 A 4	2664 D 4	4202 C 3	7610 E 4
2122 A 4	2665 E 4	4322 D 1	7611 E 4
2125 B 4	2666 E 4	4340 D 2	7650 D 4
2126 B 4	2667 E 4	4341 E 2	7651 E 4
2127 B 4	2668 E 4	4342 E 2	7652 E 4
2128 B 4	2671 E 3	4343 D 2	
2129 B 4	2672 D 4	4345 D 1	
2131 A 4	2673 E 3	4346 D 1	
2171 B 1	2674 E 3	4347 D 1	
2172 A 1	2675 E 3	4400 D 3	
2173 A 1	2677 E 3	4401 D 3	
2174 A 1	3113 B 3	4402 D 3	
2175 A 1	3114 B 4	5104 B 4	
2183 B 1	3115 B 4	5106 A 3	
2210 C 3	3116 B 4	5107 A 4	
2211 C 4	3125 B 4	5108 A 4	
2217 C 4	3126 B 4	5109 A 3	
2218 C 4	3127 B 4	5110 A 4	
2219 C 4	3128 B 4	5111 A 4	
2220 B 4	3129 B 4	5176 A 1	
2221 B 4	3130 B 4	5179 B 1	
2222 B 4	3131 B 4	5245 C 4	
2223 C 4	3132 B 4	5301 E 1	
2243 A 3	3141 B 4	5303 D 1	
2246 C 3	3152 A 1	5310 E 2	
2247 C 4	3156 A 1	5311 E 2	
2255 C 3	3157 A 1	5312 E 2	
2256 C 2	3160 A 1	5313 E 2	
2259 C 2	3161 B 1	5314 E 2	
2262 C 2	3162 A 1	5315 E 2	
2282 A 2	3163 B 1	5420 E 1	
2285 A 2	3164 B 1	5421 E 1	
2292 A 1	3165 B 1	5422 E 1	
2300 E 2	3166 A 1	5424 E 1	
2301 E 1	3168 B 1	5430 D 2	
2303 D 2	3172 B 1	5431 D 4	
2304 D 2	3173 A 1	5432 C 4	
2321 D 1	3174 A 1	5600 E 3	
2322 D 1	3175 A 1	5601 E 3	
2323 D 1	3176 A 1	5602 D 3	
2327 D 1	3177 A 1	5604 E 3	
2330 C 1	3216 C 4	5605 D 3	
2335 C 1	3217 C 4	5606 E 4	
2339 E 1	3218 C 3	5651 E 4	
2341 E 1	3219 C 4	5652 E 4	
2342 D 2	3220 C 4	5653 E 4	
2350 D 1	3229 C 4	5654 E 4	
2400 D 2	3246 C 3	6125 B 3	
2401 D 3	3247 C 3	6185 B 1	
2404 E 3	3257 C 2	6186 B 1	
2405 E 4	3262 C 2	6285 A 1	
2430 D 4	3276 A 2	6286 A 1	
2436 E 2	3312 C 1	6290 A 1	
2437 E 2	3313 C 1	6291 A 1	

12-10

CDR MAINBOARD BOTTOM SIDE



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective partslist.

2105 B 4	2468 D 3	3238 B 3	3471 D 2	7121 A 4
2106 B 4	2469 D 3	3239 B 3	3472 D 2	7130 A 4
2119 B 4	2470 D 2	3240 B 3	3473 D 2	7150 B 2
2120 A 4	2607 E 3	3241 B 3	3602 E 3	7160 A 4
2130 A 4	2611 E 3	3242 B 2	3603 E 4	7186 C 1
2132 A 4	2612 E 3	3243 B 3	3608 E 3	7200 A 3
2134 A 3	2654 E 4	3244 B 3	3609 E 3	7205 B 3
2135 A 3	2655 E 4	3245 C 3	3610 E 3	7209 B 3
2136 A 3	2656 D 4	3248 C 3	3611 E 3	7223 A 3
2138 A 3	2657 E 4	3249 C 3	3612 E 3	7224 A 3
2139 A 4	2659 D 4	3250 C 2	3613 E 3	7225 A 3
2140 A 3	2660 E 4	3251 C 3	3614 E 3	7230 B 3
2156 B 2	2662 D 4	3252 C 3	3615 E 3	7235 B 3
2157 B 2	2670 E 3	3253 C 3	3616 E 3	7240 B 2
2170 A 1	2676 E 3	3254 C 3	3617 E 3	7241 B 2
2176 A 1	3108 B 4	3255 A 3	3618 E 3	7270 A 2
2177 B 1	3109 B 4	3256 A 3	3619 E 3	7271 A 2
2178 B 1	3111 A 4	3258 C 3	3621 E 3	7272 A 2
2179 B 1	3112 A 4	3259 C 3	3622 E 3	7280 A 2
2180 B 1	3120 A 4	3260 C 3	3623 E 3	7282 A 2
2181 A 1	3121 A 4	3261 C 3	3624 E 3	7285 A 2
2182 A 1	3122 A 4	3263 B 3	3625 E 3	7286 A 1
2184 C 1	3123 A 4	3264 A 2	3626 E 3	7287 A 1
2193 C 1	3124 A 4	3265 A 2	3627 E 3	7290 A 1
2194 C 1	3133 A 4	3266 A 2	3628 E 3	7291 A 1
2195 A 4	3134 A 4	3267 C 3	3629 E 3	7294 A 2
2200 A 3	3135 A 4	3268 B 1	3630 E 3	7295 A 2
2203 A 3	3136 A 4	3269 A 2	3635 E 3	7300 E 1
2204 B 3	3137 A 4	3270 A 2	3636 E 3	7301 E 1
2205 B 3	3138 A 3	3271 A 3	3650 E 4	7302 E 2
2206 B 3	3139 A 4	3272 A 3	3651 E 4	7310 C 2
2207 B 3	3140 A 3	3273 A 2	3652 E 4	7325 C 1
2208 B 3	3142 A 4	3274 B 2	3653 E 4	7403 D 2
2214 B 3	3143 A 4	3275 B 2	3654 E 4	7404 D 3
2215 B 4	3144 A 4	3277 A 1	3658 E 4	7405 D 3
2216 C 4	3149 B 2	3279 A 2	3660 E 4	7430 D 4
2224 B 3	3150 A 4	3280 A 2	3661 E 4	7445 D 4
2225 C 4	3153 B 2	3281 B 2	3662 E 4	7446 D 3
2226 B 4	3154 B 2	3282 A 1	3663 E 4	7447 D 2
2227 A 3	3155 B 2	3283 A 1	3664 E 4	7448 D 2
2228 B 4	3158 A 1	3284 A 1	3665 E 4	7600 E 3
2229 C 4	3169 A 1	3285 A 2	3666 D 4	
2230 B 3	3171 B 1	3286 A 2	3667 D 4	
2231 A 3	3178 B 1	3287 A 1	3681 D 4	
2232 B 3	3179 B 1	3288 A 2	3900 B 3	
2233 B 3	3180 B 1	3289 A 1	3901 B 4	
2234 B 3	3181 B 1	3290 A 2	3902 B 4	
2235 B 3	3182 B 1	3291 A 2	3904 A 1	
2236 B 3	3183 C 1	3292 A 2	3908 A 1	
2237 B 3	3184 C 1	3293 A 2	3910 A 4	
2238 B 3	3185 C 1	3294 A 2	3911 A 4	
2239 B 3	3186 C 1	3295 A 2	3920 C 3	
2240 B 2	3187 C 1	3296 A 2	3923 B 2	
2241 B 3	3188 C 1	3297 A 2	3925 C 3	
2242 B 3	3189 C 1	3298 A 2	3926 C 3	
2244 A 3	3190 B 1	3299 A 3	3927 C 3	
2245 C 3	3191 B 1	3300 E 2	3928 D 3	
2248 B 2	3192 B 1	3301 E 1	3929 E 2	
2250 B 2	3193 C 1	3302 E 1	3931 E 3	
2251 C 3	3194 C 1	3303 E 1	3932 E 4	
2252 C 3	3195 C 1	3304 D 1	3933 E 3	
2258 C 3	3196 C 1	3305 E 2	4332 E 1	
2267 C 3	3199 C 1	3306 E 1	4333 E 1	
2268 B 2	3201 A 3	3307 E 1	4334 E 2	
2270 A 2	3202 A 3	3322 D 1	4335 E 2	
2280 A 2	3203 A 3	3323 D 1	4336 E 2	
2281 A 2	3204 A 3	3327 C 1	4337 E 2	
2283 B 2	3205 C 3	3330 C 1	4405 E 3	
2284 A 2	3206 C 3	3332 C 2	4600 E 4	
2286 B 2	3208 B 3	3333 C 1	4601 E 4	
2287 B 2	3209 B 3	3350 D 1	5105 A 4	
2288 A 1	3210 B 3	3362 E 2	5130 A 4	
2296 A 2	3211 B 3	3363 E 2	5132 A 4	
2297 A 2	3212 B 3	3431 D 4	5170 B 1	
2302 E 1	3213 B 3	3432 D 4	5210 C 4	
2305 E 2	3215 C 4	3433 D 4	5223 C 4	
2324 D 1	3221 B 4	3434 D 4	5255 C 2	
2325 D 1	3222 B 4	3437 D 4	5302 D 2	
2326 D 1	3223 A 3	3438 D 4	5304 D 1	
2329 C 1	3224 A 3	3439 D 4	5423 E 2	
2334 C 2	3225 A 3	3440 D 4	5425 E 1	
2336 C 2	3226 A 3	3443 D 2	6120 A 4	
2340 D 1	3227 A 3	3444 E 3	6130 B 4	
2403 D 2	3228 B 4	3445 D 4	6140 A 3	
2406 D 3	3230 A 3	3446 D 4	6141 A 3	
2431 D 4	3231 A 3	3447 D 4	6155 B 2	
2432 D 4	3232 A 3	3449 D 3	6300 E 1	
2433 D 4	3233 B 3	3450 D 3	6301 E 2	
2434 D 4	3234 A 3	3451 E 4	6430 D 4	
2435 D 4	3235 B 3	3452 D 3	6432 E 4	
2451 D 4	3236 B 3	3453 D 3	7105 B 4	
2465 D 3	3237 B 2	3470 D 2	7120 A 4	

ELECTRICAL PARTSLIST

MAINBOARD

MISCELLANEOUS

1001	4822 214 12845	MAINBOARD ASSY CDR560
1101	4822 267 60409	CONN 22P FEMALE
1102	4822 267 60409	CONN 22P FEMALE
1143	4822 242 82075	CRYSTAL 16 MHz
1177	4822 242 10557	XTL.RESONATOR 32 MHz
1251	4822 242 10757	CRYSTAL 33.868 000MHz
1290	4822 267 51454	CONN. 11P FEMALE
1320	4822 242 10236	LN-G102-139 (16MHZ)
1400	4822 267 10939	FLEX CONN. 20P. FEM. V
1500	4822 267 10939	FLEX CONN. 20P. FEM. V
1520	4822 218 11487	OPTICAL INPUT GP1F32R
1530	4822 265 11151	ANALOG INPUT/OUTPUT CINCH
1531	4822 267 31448	DIGITAL INPUT/OUTPUT CINCH

CAPACITORS

2104	4822 126 14104	82nF 10% 0805 X7R 16V
2105	5322 122 32654	22nF10%X7R 63V
2106	4822 126 13296	100nF10% X7R 16V
2107	4822 124 80483	47µF20% 6,3V
2108	4822 126 14104	82nF 10% 0805 X7R 16V
2109	4822 126 13482	470nF80/20% 16V
2110	4822 126 13482	470nF80/20% 16V
2111	4822 126 14104	82nF 10% 0805 X7R 16V
2112	4822 126 14104	82nF 10% 0805 X7R 16V
2113	4822 124 11353	1µF20% 16V
2114	4822 124 11353	1µF20% 16V
2115	4822 126 13482	470nF80/20% 16V
2116	4822 126 13482	470nF80/20% 16V
2117	5322 122 32654	22nF10%X7R 63V
2118	5322 122 32654	22nF10%X7R 63V
2119	4822 126 14104	82nF 10% 0805 X7R 16V
2120	5322 122 32654	22nF10%X7R 63V
2130	5322 122 32654	22nF10%X7R 63V
2131	4822 124 80483	47µF20% 6,3V
2132	5322 122 32654	22nF10%X7R 63V
2134	4822 122 33575	220pF 5%NPO 50V
2135	4822 122 33575	220pF 5%NPO 50V
2136	4822 122 33575	220pF 5%NPO 50V
2138	4822 122 33575	220pF 5%NPO 50V
2139	5322 116 80853	560pF 5%NP0 63V
2140	5322 122 32654	22nF10%X7R 63V
2156	5322 126 10223	4,7nF10%X7R 63V
2157	5322 122 32654	22nF10%X7R 63V
2170	5322 122 32654	22nF10%X7R 63V
2171	4822 124 40433	47µF20% 25V
2172	4822 122 33891	3,3nF10%X7R 63V
2173	4822 122 33891	3,3nF10%X7R 63V
2174	4822 122 33891	3,3nF10%X7R 63V
2175	5322 122 34123	1nF10%X7R 50V
2176	4822 126 13296	100nF10% X7R 16V
2177	5322 122 32659	33pF 5% 50V
2178	5322 122 32659	33pF 5% 50V
2179	4822 126 13296	100nF10% X7R 16V
2180	5322 122 32654	22nF10%X7R 63V
2181	5322 122 32654	22nF10%X7R 63V
2182	5322 122 32654	22nF10%X7R 63V
2183	4822 126 13296	100nF10% X7R 16V
2184	4822 122 33177	10nF 20% X7R 50V
2193	4822 122 33177	10nF 20% X7R 50V
2194	4822 122 33177	10nF 20% X7R 50V
2195	5322 122 32654	22nF10%X7R 63V
2200	4822 122 32646	5,6nF10%X7R 50V
2203	5322 122 32654	22nF10%X7R 63V
2204	5322 122 32654	22nF10%X7R 63V
2205	5322 122 32654	22nF10%X7R 63V
2206	4822 122 32627	2.7nF10%X7R 50V
2207	5322 126 10465	3,9nF 10% X7R 50V 0805 CER2
2208	5322 116 80853	560pF 5%NP0 63V
2210	5322 122 32654	22nF10%X7R 63V
2211	4822 124 80483	47µF20% 6,3V
2214	4822 126 13692	47pF 1% NP0 63V
2215	4822 122 33177	10nF 20% X7R 50V
2216	4822 122 33177	10nF 20% X7R 50V
2217	5322 122 32654	22nF10%X7R 63V
2218	5322 122 32654	22nF10%X7R 63V
2219	5322 122 32654	22nF10%X7R 63V
2220	5322 122 32654	22nF10%X7R 63V
2221	5322 122 32654	22nF10%X7R 63V
2222	5322 122 32654	22nF10%X7R 63V
2223	4822 124 80483	47µF20% 6,3V
2224	4822 126 13296	100nF10% X7R 16V
2225	5322 122 32448	10pF 5% 50V
2226	5322 122 32448	10pF 5% 50V
2227	4822 126 12105	33nF 5%X7R 63V
2228	4822 126 12105	33nF 5%X7R 63V
2229	4822 122 33177	10nF 20% X7R 50V
2230	5322 122 32654	22nF10%X7R 63V
2231	5322 122 32654	22nF10%X7R 63V
2232	4822 126 13618	330pF 1%NPO 63V
2233	4822 126 13618	330pF 1%NPO 63V
2234	4822 126 13618	330pF 1%NPO 63V
2235	5322 122 32654	22nF10%X7R 63V
2236	4822 126 13618	330pF 1%NPO 63V
2237	4822 126 13618	330pF 1%NPO 63V
2238	4822 126 13618	330pF 1%NPO 63V
2239	4822 126 13618	330pF 1%NPO 63V
2240	5322 122 32654	22nF10%X7R 63V
2241	4822 126 13618	330pF 1%NPO 63V
2242	5322 122 32654	22nF10%X7R 63V
2243	4822 124 11445	47µF20% 10V
2244	5322 122 32654	22nF10%X7R 63V
2245	5322 122 32654	22nF10%X7R 63V
2246	4822 126 13296	100nF10% X7R 16V
2247	4822 124 80483	47µF20% 6,3V
2248	5322 122 32654	22nF10%X7R 63V
2250	5322 122 32654	22nF10%X7R 63V
2251	4822 126 13486	15pF 2% NP0 63V
2252	4822 126 13486	15pF 2% NP0 63V
2255	5322 122 32654	22nF10%X7R 63V
2256	5322 122 32654	22nF10%X7R 63V
2259	5322 122 32659	33pF 5% 50V
2262	4822 126 10326	180pF 5%NP0 63V
2267	4822 126 13296	100nF10% X7R 16V
2268	4822 126 13296	100nF10% X7R 16V
2270	5322 122 32654	22nF10%X7R 63V
2280	5322 122 32654	22nF10%X7R 63V
2281	5322 122 32658	22pF 5% 50V
2282	5322 122 32654	22nF10%X7R 63V
2283	4822 126 13296	100nF10% X7R 16V
2284	5322 122 32654	22nF10%X7R 63V
2285	4822 126 13296	100nF10% X7R 16V
2286	5322 122 32658	22pF 5% 50V
2287	5322 122 32658	22pF 5% 50V
2288	4822 126 12105	33nF 5%X7R 63V
2292	4822 126 12105	33nF 5%X7R 63V
2296	4822 126 12105	33nF 5%X7R 63V

2297	4822 126 13296	100nF10% X7R 16V
2300	4822 126 13482	470nF80/20% 16V
2301	5322 122 32654	22nF10%X7R 63V
2302	4822 126 13482	470nF80/20% 16V
2303	4822 126 13482	470nF80/20% 16V
2304	5322 122 32654	22nF10%X7R 63V
2305	4822 126 13482	470nF80/20% 16V
2321	5322 122 32654	22nF10%X7R 63V
2322	5322 122 32654	22nF10%X7R 63V
2323	5322 122 32654	22nF10%X7R 63V
2324	5322 122 32654	22nF10%X7R 63V
2325	4822 126 13692	47pF 1% NP0 63V
2326	4822 126 13692	47pF 1% NP0 63V
2327	4822 122 33177	10nF 20% X7R 50V
2329	5322 122 32654	22nF10%X7R 63V
2330	4822 126 13296	100nF10% X7R 16V
2334	5322 122 32654	22nF10%X7R 63V
2336	4822 126 13692	47pF 1% NP0 63V
2339	4822 124 11445	47µF20% 10V
2340	5322 122 32654	22nF10%X7R 63V
2341	5322 122 32654	22nF10%X7R 63V
2342	5322 122 32654	22nF10%X7R 63V
2350	4822 126 12105	33nF 5%X7R 63V
2400	5322 122 32654	22nF10%X7R 63V
2401	5322 122 32654	22nF10%X7R 63V
2403	5322 122 32654	22nF10%X7R 63V
2404	5322 122 32654	22nF10%X7R 63V
2405	4822 124 42242	330µF20% 6,3V
2406	5322 122 32654	22nF10%X7R 63V
2436	4822 124 80483	47µF20% 6,3V
2437	4822 124 80483	47µF20% 6,3V
2439	4822 124 80483	47µF20% 6,3V
2442	4822 124 80483	47µF20% 6,3V
2462	4822 124 80483	47µF20% 6,3V
2463	4822 124 80483	47µF20% 6,3V
2464	5322 122 32654	22nF10%X7R 63V
2465	5322 122 34123	1nF10%X7R 50V
2466	4822 126 12102	330 nF 10% X7R 16V 0603
2467	4822 126 12105	33nF 5%X7R 63V
2468	5322 122 32654	22nF10%X7R 63V
2469	4822 126 13296	100nF10% X7R 16V
2501	4822 124 41579	10µF 20% 50V
2502	4822 126 12105	33nF 5%X7R 63V
2503	4822 126 12105	33nF 5%X7R 63V
2504	5322 122 32654	22nF10%X7R 63V
2505	5322 122 33538	150pF 2%NP0 63V
2506	5322 122 32654	22nF10%X7R 63V
2507	5322 122 32654	22nF10%X7R 63V
2509	5322 122 32654	22nF10%X7R 63V
2510	5322 122 32531	100pF 5%NP0 50V
2511	5322 122 32531	100pF 5%NP0 50V
2512	5322 122 32659	33pF 5% 50V
2513	5322 122 32659	33pF 5% 50V
2604	5322 122 32654	22nF10%X7R 63V
2605	5322 122 32654	22nF10%X7R 63V
2606	5322 122 32654	22nF10%X7R 63V
2607	5322 122 32654	22nF10%X7R 63V
2608	5322 122 32654	22nF10%X7R 63V
2609	5322 122 32654	22nF10%X7R 63V
2610	5322 122 32654	22nF10%X7R 63V
2611	4822 126 13694	68pF 1% NP0 63V
2612	4822 126 13694	68pF 1% NP0 63V
2615	4822 124 40246	4,7µF 20% 63V DXH=5X11
2616	4822 124 40246	4,7µF 20% 63V DXH=5X11
2617	4822 124 40433	47µF20% 25V
2618	4822 124 11445	47µF20% 10V
2619	4822 124 40433	47µF20% 25V
2620	4822 124 41829	1000µF20% 6,3V
2621	4822 124 11445	47µF20% 10V
2622	4822 124 80865	10µF20% 25V
2623	4822 124 80865	10µF20% 25V
2652	5322 122 32654	22nF10%X7R 63V
2653	5322 122 32654	22nF10%X7R 63V
2654	5322 122 32531	100pF 5%NP0 50V
2655	5322 122 32531	100pF 5%NP0 50V
2656	5322 126 10184	680P 5% NPO 50V.
2657	5322 126 10184	680pF 5% NPO 50V.
2658	5322 122 32654	22nF10%X7R 63V
2659	5322 122 32654	22nF10%X7R 63V
2660	5322 122 32654	22nF10%X7R 63V
2661	5322 122 32654	22nF10%X7R 63V
2662	5322 122 32654	22nF10%X7R 63V
2663	4822 124 41579	10µF 20% 50V
2664	4822 124 41829	1000µF20% 6,3V
2665	4822 124 80865	10µF20% 25V
2666	4822 124 80865	10µF20% 25V
2667	4822 124 40246	4,7µF 20% 63V DXH=5X11
2668	4822 124 40246	4,7µF 20% 63V DXH=5X11

RESISTORS

3108	4822 051 20472	4k7 5% 0,1W
3109	4822 117 10834	47k 1% 0,1W
3111	4822 051 20184	180k 5% 0,1W
3112	4822 051 20474	470k 5% 0,1W
3120	4822 051 20273	27k 5% 0,1W
3121	4822 051 20474	470k 5% 0,1W
3122	4822 051 20223	22k 5% 0,1W
3123	4822 051 20223	22k 5% 0,1W
3124	4822 051 20333	33k 5% 0,1W
3133	4822 051 20105	1M 5% 0,1W
3134	4822 051 20333	33k 5% 0,1W
3135	4822 051 20153	15k 5% 0,1W
3136	4822 117 10833	10k 1% 0,1W
3137	4822 051 20153	15k 5% 0,1W
3138	4822 117 10833	10k 1% 0,1W
3139	4822 051 20752	7k5 5% 0,1W
3140	4822 117 10834	47k 1% 0,1W
3142	4822 117 10833	10k 1% 0,1W
3143	4822 051 20105	1M 5% 0,1W
3144	4822 117 10833	10k 1% 0,1W
3149	4822 117 11449	2k2 1% 0,1W
3152	4822 051 20104	100k 5% 0,1W
3153	4822 051 10102	1k 2% 0,25W
3154	4822 051 10102	1k 2% 0,25W
3155	4822 051 20105	1M 5% 0,1W
3156	4822 051 20101	100Ω 5% 0,1W
3157	4822 051 20101	100Ω 5% 0,1W
3158	4822 051 20101	100Ω 5% 0,1W
3160	4822 051 20223	22k 5% 0,1W
3161	4822 051 20105	1M 5% 0,1W
3162	4822 051 20105	1M 5% 0,1W
3163	4822 051 20393	39k 5% 0,1W
3164	4822 051 20223	22k 5% 0,1W
3165	4822 051 20101	100Ω 5% 0,1W
3166	4822 051 20393	39k 5% 0,1W
3168	4822 051 20101	100Ω 5% 0,1W
3169	4822 051 20101	100Ω 5% 0,1W
3171	4822 051 20121	120Ω 5% 0,1W
3172	4822 051 20105	1M 5% 0,1W
3173	4822 051 20101	100Ω 5% 0,1W
3174	4822 051 20101	100Ω 5% 0,1W
3175	4822 051 20101	100Ω 5% 0,1W
3176	4822 051 20101	100Ω 5% 0,1W
3177	4822 051 20101	100Ω 5% 0,1W
3178	4822 051 20223	22k 5% 0,1W
3179	4822 051 20101	100Ω 5% 0,1W
3180	4822 117 10833	10k 1% 0,1W

3181	4822 051 20562	5k6 5% 0,1W 0805
3182	4822 051 20562	5k6 5% 0,1W 0805
3183	4822 051 20472	4k7 5% 0,1W
3184	4822 051 20101	100Ω 5% 0,1W
3185	4822 051 20101	100Ω 5% 0,1W
3186	4822 117 10833	10k 1% 0,1W
3187	4822 051 10102	1k 2% 0,25W
3188	4822 117 10833	10k 1% 0,1W
3189	4822 051 20109	10Ω 5% 0,1W
3190	4822 117 10833	10k 1% 0,1W
3191	4822 051 20562	5k6 5% 0,1W 0805
3192	4822 051 20562	5k6 5% 0,1W 0805
3193	4822 051 20472	4k7 5% 0,1W
3194	4822 051 20101	100Ω 5% 0,1W
3195	4822 051 20101	100Ω 5% 0,1W
3196	5322 117 11726	10Ω 5%
3201	4822 051 20223	22k 5% 0,1W
3202	4822 051 20393	39k 5% 0,1W
3203	4822 051 20109	10Ω 5% 0,1W
3204	4822 117 11454	820Ω 1% 0,1W
3205	4822 117 11504	270Ω 1% 0.1W
3206	4822 051 20105	1M 5% 0,1W
3208	4822 051 20229	22Ω 5% 0,1W
3209	4822 051 20223	22k 5% 0,1W
3210	4822 051 20393	39k 5% 0,1W
3211	4822 051 20109	10Ω 5% 0,1W
3212	4822 117 11454	820Ω 1% 0,1W
3213	4822 051 20472	4k7 5% 0,1W
3215	4822 117 10833	10k 1% 0,1W
3216	4822 051 20101	100Ω 5% 0,1W
3217	4822 051 20101	100Ω 5% 0,1W
3218	4822 051 20101	100Ω 5% 0,1W
3219	4822 051 20101	100Ω 5% 0,1W
3220	4822 051 20101	100Ω 5% 0,1W
3221	4822 051 20472	4k7 5% 0,1W
3222	4822 051 20101	100Ω 5% 0,1W
3223	4822 051 20229	22Ω 5% 0,1W
3224	4822 051 10102	1k 2% 0,25W
3225	4822 051 10102	1k 2% 0,25W
3226	4822 117 11454	820Ω 1% 0,1W
3227	4822 051 20561	560Ω 5% 0,1W
3228	4822 117 10833	10k 1% 0,1W
3229	4822 117 10833	10k 1% 0,1W
3230	4822 051 20472	4k7 5% 0,1W
3231	4822 117 11751	16k RC12H 1% 0805
3232	4822 117 11145	4k7 1% 0,1W
3233	4822 117 10839	130k 1% 0.1W
3234	4822 117 10833	10k 1% 0,1W
3235	4822 117 11751	16k RC12H 1% 0805
3236	4822 117 11145	4k7 1% 0,1W
3237	4822 117 10833	10k 1% 0,1W
3238	4822 117 10833	10k 1% 0,1W
3239	4822 117 10839	130k 1% 0.1W
3240	4822 117 10839	130k 1% 0.1W
3241	4822 051 20472	4k7 5% 0,1W
3242	4822 051 20105	1M 5% 0,1W
3243	4822 051 20564	560k 5% 0,1W
3244	4822 117 11449	2k2 1% 0,1W
3245	4822 051 20104	100k 5% 0,1W
3246	4822 051 20394	390k 5% 0,1W
3247	4822 117 11503	220Ω 1% 0.1W
3248	4822 051 20223	22k 5% 0,1W
3249	4822 051 20104	100k 5% 0,1W
3250	4822 051 20101	100Ω 5% 0,1W
3251	4822 051 20223	22k 5% 0,1W
3252	4822 051 20223	22k 5% 0,1W
3253	4822 051 20223	22k 5% 0,1W
3254	4822 051 20472	4k7 5% 0,1W
3255	4822 117 11449	2k2 1% 0,1W
3256	4822 051 20339	33Ω 5% 0,1W
3257	4822 051 20339	33Ω 5% 0,1W
3259	4822 117 10833	10k 1% 0,1W
3260	4822 117 11139	1k5 1% 0,1W
3261	4822 117 11449	2k2 1% 0,1W
3262	4822 051 20101	100Ω 5% 0,1W
3263	4822 117 10834	47k 1% 0,1W
3264	4822 051 10102	1k 2% 0,25W
3265	4822 051 10102	1k 2% 0,25W
3266	4822 051 10102	1k 2% 0,25W
3267	4822 117 10833	10k 1% 0,1W
3268	4822 051 20392	3k9 5% 0,1W
3269	4822 051 10102	1k 2% 0,25W
3270	4822 117 10965	18k 1% 0,1W
3271	4822 117 10965	18k 1% 0,1W
3272	4822 117 10965	18k 1% 0,1W
3273	4822 051 10102	1k 2% 0,25W
3274	4822 117 10965	18k 1% 0,1W
3275	4822 051 20223	22k 5% 0,1W
3276	4822 051 20223	22k 5% 0,1W
3277	4822 051 20223	22k 5% 0,1W
3279	4822 051 10102	1k 2% 0,25W
3280	4822 051 10102	1k 2% 0,25W
3281	4822 051 10102	1k 2% 0,25W
3282	4822 051 10102	1k 2% 0,25W
3283	4822 051 10102	1k 2% 0,25W
3284	4822 051 20479	47Ω 5% 0,1W
3285	4822 051 20562	5k6 5% 0,1W 0805
3286	4822 051 20562	5k6 5% 0,1W 0805
3287	4822 051 10102	1k 2% 0,25W
3288	4822 051 10102	1k 2% 0,25W
3289	4822 051 20479	47Ω 5% 0,1W
3290	4822 051 20562	5k6 5% 0,1W 0805
3291	4822 051 20562	5k6 5% 0,1W 0805
3292	4822 051 10102	1k 2% 0,25W
3293	4822 051 10102	1k 2% 0,25W
3294	4822 051 20479	47Ω 5% 0,1W
3295	4822 051 20562	5k6 5% 0,1W 0805
3296	4822 051 20562	5k6 5% 0,1W 0805
3297	4822 117 11503	220Ω 1% 0.1W
3298	4822 117 11503	220Ω 1% 0.1W
3299	4822 051 20229	22Ω 5% 0,1W
3300	4822 117 10834	47k 1% 0,1W
3301	4822 051 20684	680k 5% 0,1W
3302	4822 051 20471	470Ω 5% 0,1W
3303	4822 051 10102	1k 2% 0,25W
3304	4822 117 10834	47k 1% 0,1W
3305	4822 051 20684	680k 5% 0,1W
3306	4822 051 20471	470Ω 5% 0,1W
3307	4822 051 10102	1k 2% 0,25W
3312	4822 117 10833	10k 1% 0,1W
3313	4822 117 10833	10k 1% 0,1W
3315	4822 117 10833	10k 1% 0,1W
3317	4822 117 10833	10k 1% 0,1W
3319	4822 117 10833	10k 1% 0,1W
3322	4822 117 10833	10k 1% 0,1W
3323	4822 051 20105	1M 5% 0,1W
3326	4822 051 20104	100k 5% 0,1W
3327	4822 117 10833	10k 1% 0,1W
3328	4822 117 11507	6k8 1% 0,1W
3330	4822 051 20101	100Ω 5% 0,1W
3332	4822 051 10102	1k 2% 0,25W
3333	4822 117 10833	10k 1% 0,1W
3334	4822 117 10833	10k 1% 0,1W
3350	4822 051 20472	4k7 5% 0,1W
3360	4822 117 10833	10k 1% 0,1W
3362	4822 117 10833	10k 1% 0,1W

3363	4822 117 10833	10k 1% 0,1W
3364	4822 117 10833	10k 1% 0,1W
3380	4822 117 10833	10k 1% 0,1W
3443	4822 051 20223	22k 5% 0,1W
3444	4822 051 20223	22k 5% 0,1W
3447	4822 117 10834	47k 1% 0,1W
3449	4822 051 20104	100k 5% 0,1W
3450	4822 051 20104	100k 5% 0,1W
3451	4822 051 20101	100Ω 5% 0,1W
3452	4822 117 10833	10k 1% 0,1W
3453	4822 117 10833	10k 1% 0,1W
3462	4822 051 20223	22k 5% 0,1W
3463	4822 051 20223	22k 5% 0,1W
3464	4822 117 11504	270Ω 1% 0.1W
3470	4822 051 20562	5k6 5% 0,1W 0805
3471	4822 051 20562	5k6 5% 0,1W 0805
3472	4822 051 20562	5k6 5% 0,1W 0805
3473	4822 051 20562	5k6 5% 0,1W 0805
3503	4822 051 20689	68Ω 5% 0,1W
3504⚠	4822 117 11152	4Ω7 5%
3505	4822 051 20332	3k3 5% 0,1W
3506	4822 051 20332	3k3 5% 0,1W
3507⚠	4822 117 11152	4Ω7 5%
3508	4822 051 20759	75Ω 5% 0,1W
3509	4822 051 20104	100k 5% 0,1W
3510	4822 051 20104	100k 5% 0,1W
3511	4822 117 11373	100Ω 1% RC12H 0805
3512	4822 117 11449	2k2 1% 0,1W
3513	4822 117 11373	100Ω 1% RC12H 0805
3514	4822 117 11449	2k2 1% 0,1W
3515	4822 117 11373	100Ω 1% RC12H 0805
3516	4822 117 11449	2k2 1% 0,1W
3517	4822 117 11373	100Ω 1% RC12H 0805
3518	4822 117 11449	2k2 1% 0,1W
3614	4822 051 20008	0Ω JUMP. (0805)
3620	4822 117 10833	10k 1% 0,1W
3621	4822 051 20104	100k 5% 0,1W
3622	4822 051 20008	0Ω JUMP. (0805)
3623	4822 051 20104	100k 5% 0,1W
3624	4822 117 10833	10k 1% 0,1W
3625	4822 117 10833	10k 1% 0,1W
3626	4822 051 20334	330k 5% 0,1W
3627	4822 117 10833	10k 1% 0,1W
3628	4822 117 10833	10k 1% 0,1W
3629	4822 051 20334	330k 5% 0,1W
3630	4822 117 11188	20k 1% 0,1W
3631	4822 117 11504	270Ω 1% 0.1W
3632	4822 117 11504	270Ω 1% 0.1W
3635	4822 051 20008	0Ω JUMP. (0805)
3636	4822 051 20008	0Ω JUMP. (0805)
3654	4822 051 20104	100k 5% 0,1W
3658	4822 051 20104	100k 5% 0,1W
3659	4822 117 10833	10k 1% 0,1W
3660	4822 117 10833	10k 1% 0,1W
3661	4822 117 11437	8k2 1% 0.1W
3662	4822 117 11437	8k2 1% 0.1W
3663	4822 117 13085	5k6 1% RC12H 0,1W 0805
3664	4822 117 13085	5k6 1% RC12H 0,1W 0805
3665	4822 051 20223	22k 5% 0,1W
3666	4822 051 20223	22k 5% 0,1W
3667	4822 117 10834	47k 1% 0,1W
3680⚠	4822 117 11152	4Ω7 5%
3681⚠	4822 117 11152	4Ω7 5%
3900	4822 051 20008	0Ω JUMP. (0805)
3901	4822 051 20008	0Ω JUMP. (0805)
3902	4822 051 20008	0Ω JUMP. (0805)
3903	4822 051 20008	0Ω JUMP. (0805)
3904	4822 051 20008	0Ω JUMP. (0805)
3905	4822 051 20008	0Ω JUMP. (0805)
3906	4822 051 20008	0Ω JUMP. (0805)
3908	4822 051 20008	0Ω JUMP. (0805)
3911	4822 051 20008	0Ω JUMP. (0805)
3920	4822 051 20008	0Ω JUMP. (0805)
3921	4822 051 20101	100Ω 5% 0,1W
3922	4822 051 20101	100Ω 5% 0,1W
3923	4822 117 10834	47k 1% 0,1W
3924	4822 051 20472	4k7 5% 0,1W
4xxx	4822 051 20008	0□ JUMP. (0805)

COILS

5104	4822 157 71659	100µH 15% 7A06L
5105⚠	4822 157 71206	BLM21A601SPT
5106	4822 157 71658	27µH 15% 7A06L
5107	4822 157 71658	27µH 15% 7A06L
5108	4822 157 71658	27µH 15% 7A06L
5109	4822 157 71658	27µH 15% 7A06L
5110	4822 157 71659	100µH 15% 7A06L
5111	4822 157 71659	100µH 15% 7A06L
5130⚠	4822 157 71206	BLM21A601SPT
5132⚠	4822 157 71206	BLM21A601SPT
5170⚠	4822 157 71206	BLM21A601SPT
5176⚠	4822 157 71206	BLM21A601SPT
5179⚠	4822 157 71206	BLM21A601SPT
5210⚠	4822 157 71206	BLM21A601SPT
5223⚠	4822 157 71206	BLM21A601SPT
5245⚠	4822 157 71206	BLM21A601SPT
5255⚠	4822 157 71206	BLM21A601SPT
5301⚠	4822 157 71206	BLM21A601SPT
5302⚠	4822 157 71206	BLM21A601SPT
5303⚠	4822 157 71206	BLM21A601SPT
5304⚠	4822 157 71206	BLM21A601SPT
5310	4822 242 10958	NFM39R12C102T1
5311	4822 242 10958	NFM39R12C102T1
5312	4822 242 10958	NFM39R12C102T1
5313	4822 242 10958	NFM39R12C102T1
5314	4822 242 10958	NFM39R12C102T1
5315	4822 242 10958	NFM39R12C102T1
5420	4822 242 82201	DSS306-92F223Z16
5421	4822 157 11716	BLM21P300SPT
5422	4822 242 82201	DSS306-92F223Z16
5423	4822 157 11716	BLM21P300SPT
5424	4822 242 82201	DSS306-92F223Z16
5425	4822 157 11716	BLM21P300SPT
5430⚠	4822 157 71206	BLM21A601SPT
5450	4822 157 70601	100µH (920927085A)
5602⚠	4822 157 71206	BLM21A601SPT
5651⚠	4822 157 71206	BLM21A601SPT
5652⚠	4822 157 71206	BLM21A601SPT

DIODES

6120	4822 130 10654	BAT254
6130	4822 130 11397	BAS316
6140	4822 130 11397	BAS316
6141	4822 130 11397	BAS316
6155	4822 130 10654	BAT254
6185	4822 130 11397	BAS316
6186	4822 130 11397	BAS316
6285	4822 130 11397	BAS316
6286	4822 130 11397	BAS316
6290	4822 130 11397	BAS316
6291	4822 130 11397	BAS316
6295	4822 130 11397	BAS316
6296	4822 130 11397	BAS316
6300	4822 130 11397	BAS316
6301	4822 130 11397	BAS316
6432	4822 130 11397	BAS316

TRANSISTORS AND INTEGRATED CIRCUITS

7105	4822 209 15602	SZA1010T/k1
7120	5322 130 44787	BFR31
7121	5322 130 60508	BC857B
7130	4822 209 33421	OQ8845
7150	4822 209 30732	LM319D
7170	4822 209 14785	SERVO CONTROLLER V 2.1
7182	5322 130 60508	BC857B
7183	4822 130 60142	BC869
7185	5322 130 61569	BC868
7186	4822 130 60511	BC847B
7192	5322 130 60508	BC857B
7193	4822 130 60142	BC869
7195	5322 130 61569	BC868
7200	4822 130 60511	BC847B
7205	4822 209 60792	74HC4053D
7209	4822 130 60511	BC847B
7210	4822 209 16438	CD65WD
7223	5322 130 42718	BFS20
7224	4822 130 60383	BF824
7225	5322 130 42718	BFS20
7230	5322 209 61482	PC74HC4066T
7235	4822 209 30095	LM833D
7240	5322 209 61482	PC74HC4066T
7241	5322 209 73179	74HCT74D
7245	4822 209 33417	TDA1371H/N1
7270	4822 209 31615	LM324AD
7271	4822 130 60511	BC847B
7272	5322 130 60508	BC857B
7280	4822 209 60792	74HC4053D
7282	4822 209 31615	LM324AD
7285	5322 209 61482	PC74HC4066T
7286	4822 130 60511	BC847B
7287	5322 130 60508	BC857B
7288	4822 130 60142	BC869
7289	5322 130 61569	BC868
7290	4822 130 60511	BC847B
7291	5322 130 60508	BC857B
7292	4822 130 60142	BC869
7293	5322 130 61569	BC868
7294	4822 130 60511	BC847B
7295	5322 130 60508	BC857B
7296	4822 130 60142	BC869
7297	5322 130 61569	BC868
7300	4822 209 30095	LM833D
7301	4822 130 60511	BC847B
7302	4822 130 60511	BC847B
7310	4822 209 31275	MC34064D5
7320	4822 209 16834	MC68HC08AB0
7322	4822 209 16934	IC USER CDR560
7323	4822 209 16439	CY6264-70SNC
7325	5322 209 11548	74HC14D
7326	4822 130 60511	BC847B
7403	5322 209 61482	PC74HC4066T
7404	5322 209 61482	PC74HC4066T
7405	5322 209 73179	74HCT74D
7410	5322 209 61132	PC74HCT4052T
7411	5322 209 61132	PC74HCT4052T
7445	5322 130 60508	BC857B
7446	5322 130 60508	BC857B
7447	4822 130 60511	BC847B
7448	4822 130 60511	BC847B
7465	4822 209 33395	TDA1315H/N2
7500	5322 209 11517	PC74HCU04T
7501	4822 130 60511	BC847B
7502	4822 130 60511	BC847B
7503	4822 130 60511	BC847B
7504	4822 130 60511	BC847B
7603	4822 209 33397	SAA7366T
7604	4822 209 72042	L78L05ACZ
7650	4822 209 33403	TDA1305T/N2
7651	4822 209 30095	LM833D

DISPLAY BOARD

MISCELLANEOUS

1002/3	4822 256 10522	FTD HOLDER
1201	4822 276 13114	TACT SWITCH
1202	4822 276 13114	TACT SWITCH
1203	4822 276 13114	TACT SWITCH
1204	4822 276 13114	TACT SWITCH
1205	4822 276 13114	TACT SWITCH
1206	4822 276 13114	TACT SWITCH
1207	4822 276 13114	TACT SWITCH
1208	4822 276 13114	TACT SWITCH
1209	4822 276 13114	TACT SWITCH
1210	4822 276 13114	TACT SWITCH
1211	4822 276 13114	TACT SWITCH
1212	4822 276 13114	TACT SWITCH
1213	4822 276 13114	TACT SWITCH
1230	4822 242 10753	CSTCS8,00MT-TC
1295	4822 276 13489	ON/OFF SWITCH

CAPACITORS

2200	5322 122 32654	22nF10%X7R 63V
2201	5322 122 32658	22pF 5% 50V
2202	5322 122 32658	22pF 5% 50V
2203	5322 122 32654	22nF10%X7R 63V
2204	5322 122 32658	22pF 5% 50V
2205	5322 122 32658	22pF 5% 50V
2206	4822 126 12105	33nF 5%X7R 63V
2207	5322 122 32654	22nF10%X7R 63V
2208	5322 122 32654	22nF10%X7R 63V
2209	5322 122 32654	22nF10%X7R 63V

RESISTORS

3200	4822 051 20393	39k 5% 0,1W
3201	4822 051 10102	1k 2% 0,25W
3202	4822 051 10102	1k 2% 0,25W
3205	4822 051 20101	100Ω 5% 0,1W
3206	4822 051 20101	100Ω 5% 0,1W
3207	4822 051 20472	4k7 5% 0,1W
3210	4822 051 20472	4k7 5% 0,1W
3211	4822 051 20472	4k7 5% 0,1W
3212	4822 051 20472	4k7 5% 0,1W
3213	4822 051 20472	4k7 5% 0,1W
3214	4822 051 20472	4k7 5% 0,1W
3215	4822 051 20008	0Ω JUMP. (0805)
3216	4822 051 20008	0Ω JUMP. (0805)
3220	4822 117 11449	2k2 1% 0,1W
3221	4822 117 10833	10k 1% 0,1W
3222	4822 117 10833	10k 1% 0,1W
3223	4822 117 10833	10k 1% 0,1W
3224	4822 117 10833	10k 1% 0,1W
3299	4822 100 90108	20k
4xxx	4822 051 10008	0Ω 5% 0,25W
4019	4822 051 20008	0Ω JUMP. (0805)
4030	4822 051 20008	0Ω JUMP. (0805)
4034	4822 051 20008	0Ω JUMP. (0805)
4041	4822 051 20008	0Ω JUMP. (0805)

INTEGRATED CIRCUITS

6200	4822 212 30842	TSOP1736SB1
6201	4822 130 11088	BZX284-C2V4
7200	4822 209 16055	TMP87PM74ZF
7205	4822 135 00251	BJ363Gk
7350	4822 209 30095	LM833D

CONNECTIONS

8001	4822 320 12499	CWAS FLEX CDR 20P

POWER SUPPLY BOARD

MISCELLANEOUS

1003	4822 218 11938	PSU ASSY 20PS314/00
4⚠	4822 265 31015	MAINS INLET /00
9⚠	4822 256 92053	FUSE HOLDER CLICK (PROM)
1120⚠	4822 070 32002	FUSE 218002.(2A)
1125	4822 252 60151	SURGE PROTECT DSP-501N-A21F A

CAPACITORS

2101	4822 126 13695	82pF 1% NP0 63V
2102	5322 126 10511	1nF 5%NP0 50V
2103	5322 122 32268	470pF 10% 50V
2104	5322 126 10223	4,7nF10%X7R 63V
2109	5322 122 31865	1,5nF10%X7R 63V
2110	4822 124 41576	2,2µF 20% 50V
2111	4822 126 13196	100nF 10% 0805 X7R 25V
2113	4822 122 33127	2,2nF10%X7R 63V
2114	4822 126 13196	100nF 10% 0805 X7R 25V
2120	4822 121 10799	330nF 20% MPP 250V
2121	4822 124 12281	150µF 20% 400V
2125	4822 121 51598	2,2nF 5% 400V
2126	4822 121 51598	2,2nF 5% 400V
2127	4822 126 14496	470pF 10% 1KV
2129	4822 124 81024	4,7µF20% 50V
2131⚠	4822 126 14497	2,2nF 20% 250V
2133	4822 124 12062	100uF 20% 25V
2201	4822 126 13196	100nF 10% 0805 X7R 25V
2202	5322 122 32654	22nF10%X7R 63V
2203	4822 124 40248	10µF20% 63V
2210	4822 124 12282	2200µF 20% YK 10V
2211	4822 122 31173	220pF 10% 500V
2212	4822 121 43526	47nF 5% 250V
2220	4822 124 40849	330µF 20% 16V
2222	4822 124 12283	100µF 20% MS7 6.3V
2230	4822 124 81144	1000µF 16V
2240	4822 124 41545	220µF20% 16V
2242	4822 124 41584	100µF 20% 10V
2250	4822 124 40248	10µF20% 63V
2260	4822 122 31175	1nF 10% 500V

RESISTORS

3101	4822 116 52304	82k 5% 0,5W
3102	4822 051 20223	22k 5% 0,1W
3103	4822 051 20822	8k2 5% 0,1W
3104	4822 051 20153	15k 5% 0,1W
3105	4822 051 20153	15k 5% 0,1W
3106	4822 051 20102	1k 5% 0,1W
3107	4822 051 20184	180k 5% 0,1W
3108	4822 117 10965	18k 1% 0,1W
3109	4822 051 20331	330Ω 5% 0,1W
3110	4822 117 10833	10k 1% 0,1W
3111	4822 051 20229	22Ω 5% 0,1W
3112	4822 051 20101	100Ω 5% 0,1W
3113	4822 051 20159	15Ω 5% 0,1W
3115	4822 116 52232	910Ω 5% 0,5W
3116	4822 117 11448	180Ω 1% 0,1W
3120	4822 116 21217	1MA/423V 800V
3122	4822 117 13515	2Ω7 3W AC03 WW
3123	4822 050 21803	18k 1% 0,6W
3124	4822 116 83872	220Ω 5% 0,5W
3125	4822 050 21002	1k 1% 0,6W
3126	4822 116 80676	1Ω5 5% 0,5W
3127	4822 116 80676	1Ω5 5% 0,5W
3128	4822 116 80676	1Ω5 5% 0,5W
3129	4822 116 83864	10k 5% 0,5W
3134	4822 050 21803	18k 1% 0,6W
3201	4822 050 21002	1k 1% 0,6W
3202	4822 050 13302	3k3 1% 0,4W
3203	4822 116 52175	100Ω 5% 0,5W
3204	4822 051 20182	1k8 5% 0,1W
3205	4822 051 20008	0Ω JUMP. (0805)
3206	4822 051 20332	3k3 5% 0,1W
3221	4822 051 20182	1k8 5% 0,1W
3222	4822 051 20102	1k 5% 0,1W
3230	4822 050 21002	1k 1% 0,6W
4110	4822 051 20008	0Ω JUMP. (0805)

COILS

5120⚠	4822 157 53348	FILTER CHOKE ASSY CU15D3
5125	4822 157 11411	100MHz
5131⚠	4822 146 11062	TRANSFORMER CT296F CDR765
5132	4822 157 51462	10µH
5210	4822 157 11722	6,8µH 20% 7,7X9,5
5215	4822 157 11722	6,8µH 20% 7,7X9,5
5220	4822 157 51462	10µH
5225	4822 157 53139	4,7µH
5226	4822 157 53139	4,7µH
5230	4822 157 50963	2,2µH
5240	4822 157 51462	10µH
5250	4822 157 51462	10µH
5255	4822 157 51195	1µH 20% 4X9,8MM AXIAL

DIODES

6102	4822 130 31603	1N4006
6103	4822 130 31603	1N4006
6104	4822 130 31603	1N4006
6105	4822 130 31603	1N4006
6106	4822 130 42606	BYD33J
6107	4822 130 42606	BYD33J
6113	4822 130 32245	BYV10-40
6114	4822 130 42488	BYD33D
6129	5322 130 80122	BZX84-C24
6132	4822 130 42488	BYD33D
6201	4822 130 34328	BZX79-B30
6210	4822 130 83801	PBYR745F
6211	4822 130 42488	BYD33D
6212	4822 130 42488	BYD33D
6220	4822 130 42488	BYD33D
6230	4822 130 80983	BYW29F-150
6231	4822 130 31603	1N4006
6240	4822 130 42488	BYD33D
6250	4822 130 42606	BYD33J
6275	4822 130 30621	1N4148

IC's

7110	4822 209 90025	MC44603P
7125	4822 130 63689	STP3N60FI
7200⚠	4822 130 91451	CQY80NG
7201	4822 209 16944	KA431AZ
7221	4822 209 80591	LM317T
7249	4822 209 82112	MC7908CT
7250	4822 209 31257	MC79L24ACP